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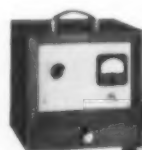
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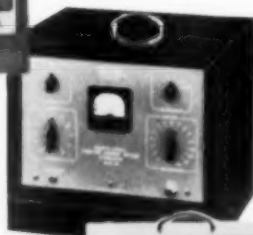
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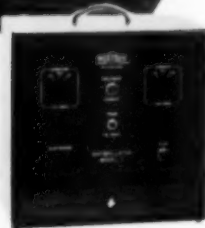


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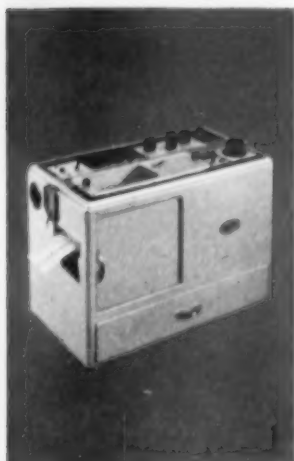
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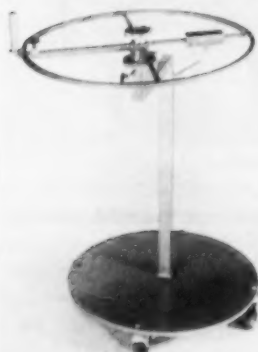
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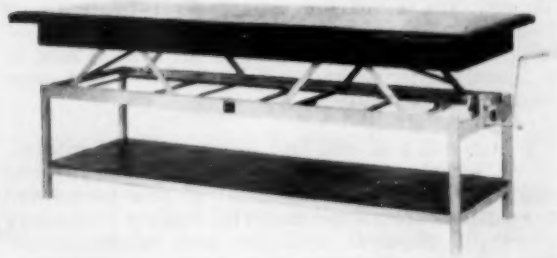
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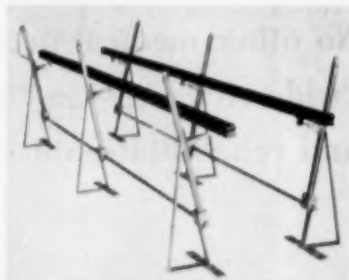
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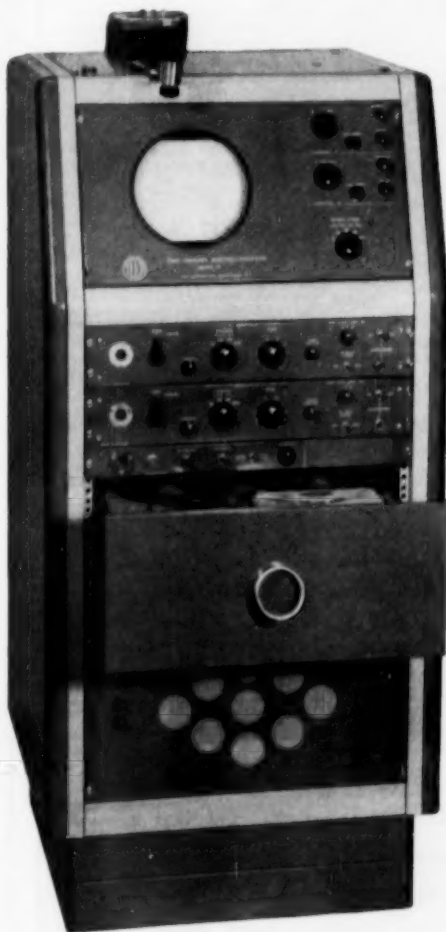
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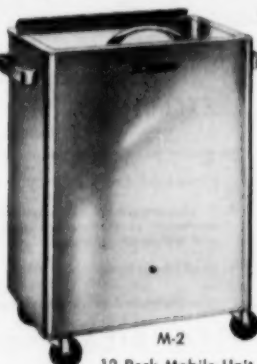


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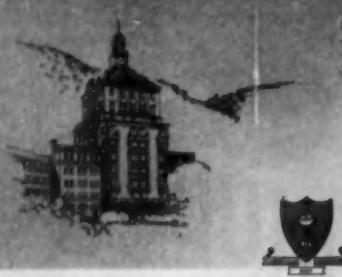
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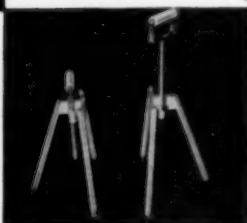
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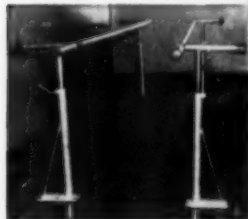
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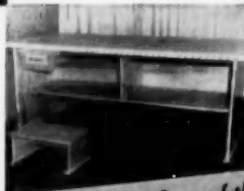
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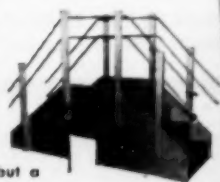


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Study of Cardiac Output During Rehabilitation Activities

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At the present time we have meager information to guide us in any attempted program of rehabilitation of patients with cardiac disease or disability. In the first place we do not have a clinical method for assessing accurately the ability of the heart to do work. In the second place we know very little about the work that the heart must do under varying conditions of activity, either in or out of the hospital. The methods of measuring cardiac output by rebreathing foreign gases, by cardiac catheterization, or by injection and measurement of the rate of distribution of dyes are subject to a number of inherent errors that limit their accuracy. Each system of measurement requires artificial and restricting conditions at the time of the measurement. It is difficult or impossible to measure cardiac output during many types of physical activity. Moreover, factors other than physical work influence the cardiac output.

We can estimate maximal cardiac output only if we stress the heart so that it is working maximally. If the heart is working below full capacity, we have no way of knowing the reserve capacity available. Understandably, we do not feel justified to work a patient with heart disease to the point of failure merely to determine his cardiac capacity. As a matter of fact, under these conditions, we wish to keep the cardiac demand well below the maximal capacity of the heart. One reason for wishing to know a patient's cardiac capacity is to be able to protect him against activities that are severe enough to tax the heart to capacity. In the absence of a reliable clinical test of the capacity of the heart to do work, caution dictates that the patient with severe heart damage should be on a very restricted activity program in order to place the least possible stress on the damaged myocardium.

We know very little about the stresses placed on the heart by normal activity. Some studies have been reported of cardiac output under various conditions of rest and work. The limited activities allowed the patient with cardiac disease while he is in the hospital or in early convalescence have been studied only to a limited extent.¹ If we cannot know with any accuracy the cardiac reserve of the individual patient with cardiac disease but we believe that it is desirable to protect the patient against cardiac strain, we should know the level of stress imposed by the various activities which that patient may perform. This study was undertaken to evaluate the effect on the output of the heart of some ward activities and light activities in occupational therapy.

Methods

All studies were made on subjects in the fasting state. The subjects were young women students in occupational therapy. They came to the laboratory after fasting since the previous evening when the tests were carried out in the morning, or after fasting since breakfast when the tests were carried out after noon. Patient rested for 30 minutes in a supine position on a standard hospital bed in a laboratory where there was a minimum of distracting noises. At the end of the rest period oral temperature, blood pressure, and pulse rate were recorded. Oxygen consumption was measured using either a McKesson Metabolar spirometer from which oxygen was inhaled or a Tissot type spirometer for collecting expired air

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for analysis. The patient breathed through a standard mouthpiece connected to the spirometer by a 6-foot tube of 1-inch internal diameter. The mouthpiece was supported by a yoke around the neck so that the patient could turn her head freely and carry on necessary activities while oxygen consumption was being recorded. When the expired air was collected in the large spirometer, it was analyzed for oxygen and carbon dioxide by the method of Scholander.² The oxygen consumption was calculated from the difference between room air and expired air. The respiratory quotient was also calculated.

Cardiac output was calculated using Grollman's acetylene method for estimating arteriovenous oxygen difference.³ In calculating cardiac output the solubility coefficient for acetylene of 0.00921 as determined by Chapman was employed.⁴ The acetylene rebreathing bag was prevented from collapsing by a 14-inch plastic tube of $\frac{1}{2}$ inch bore and contained 42 holes which ran down the center of the bag from the mouthpiece.

For most of the estimations of cardiac output, alveolar air samples were collected from the rebreathing bag at the end of expiration after four breaths requiring 9 seconds' time and at the end of 15 seconds after three more breaths. Chapman's⁴ studies indicated that when gas sampling is completed at 19 seconds there may be a 5 per cent error due to recirculation of acetylene in the venous blood. If the final gas sample is collected at 24 seconds after rebreathing is begun, the error due to recirculation of acetylene may be 10 per cent. Alveolar air samples were collected as indicated previously for analysis of carbon dioxide, oxygen, and acetylene from which cardiac output could be calculated. After the estimation of cardiac output at rest the patient assumed the position of the test and maintained it without doing work while metabolism and cardiac output were estimated again. A period of at least 30 minutes was allowed between intervals of acetylene rebreathing to allow excretion of the acetylene that had been absorbed into the blood. The third measurement of oxygen consumption and

acetylene uptake was made after the patient was working at a steady state on the activity under study.

Sitting Unsupported on Edge of Bed:

The metabolic demand and cardiac output required of a patient who sat on the edge of the bed with her feet supported on a chair was determined. The basal metabolism and cardiac output were measured after the subject had been lying supine in bed for 30 minutes. Then the patient sat in the bed with the Gatch frame adjusted at a 45 degree angle; after a 30-minute rest the oxygen consumption and the acetylene uptake were estimated again. After a further 30-minute wait, the patient sat in a relaxed position on the side of the bed with arms in lap as most patients will do early in convalescence. During this period of sitting the feet were supported in a comfortable position on the seat of a straight chair. Oxygen consumption and acetylene uptake were again measured. Alveolar air samples were collected at 9 seconds and 15 seconds of rebreathing after four and then three additional breaths.

Getting Out of and Into Bed:

The energy requirement and cardiac output requirement for getting out of and into bed without assistance was determined for normal subjects. This data does not represent the peak load of oxygen consumption or cardiac output during this activity but rather the average throughout the whole period of activity. A standard hospital bed 34 inches high was used for the study. The patient stepped to an 8-inch footstool and from there to the floor. Following a flashing timer, the subject carried out the following sequence of activities at 9-second intervals: 1. The patient rose from a supine position to sit on the edge of the bed. 2. The patient rose to stand on the footstool by the side of the bed. 3. The patient stepped from the footstool to the floor. 4. The patient stepped from the floor to the footstool. 5. The patient sat on the edge of the bed. 6. The patient returned to the supine position in bed. This activity was carried out continuously through the 6-minute period used for recording oxygen consumption.

For estimation of oxygen consumption and cardiac output at rest the patient lay supine in bed. In four of these tests oxygen consumption was determined from uptake when the subject was breathing pure oxygen. In the remainder of the tests oxygen uptake was calculated from the expired air collected in a spirometer. There was no significant difference in metabolism determined in these two ways. In the second control, the subject reclined at a 45 degree angle for a period of 30 minutes following which oxygen consumption and cardiac output were determined. The patient began getting out of and into bed several minutes prior to the collection of expired air for determination of oxygen consumption during this activity. The expired air was collected over a 6-minute period. The patient stopped the activity momentarily while sitting and rebreathed the acetylene-oxygen mixture for determination of the cardiac output. Throughout this study the pulse rate was recorded continuously.

Leather Tooling: The subject tooled a standard design on leather while sitting in a bed with a Gatch frame and reclining at an angle of 45 degrees. The bed table had the working surface inclined at an angle convenient for the patient. The patient rested her forearms on the table as she worked. A 3 x 3 inch piece of tooling leather that had previously been moistened and conditioned for tooling was marked with a conventional design. The subject used a liner and spooner modeling tool to follow out this design. The initial metabolism and cardiac output were measured while the patient lay supine. After a 30-minute rest at a 45 degree angle, the second metabolism and cardiac output were measured.

Leather Stamping: The subject was seated in a straight-backed chair in front of a table at elbow height. The subject hammered a standard design into a previously moistened and conditioned 3 x 4 inch piece of cowhide. A rubber-headed mallet and a background stamping tool were used. A metronome sounded once per second to meter the rate of stamping to assure a standard activity.

Chip Carving: The subject was seated in a straight-backed chair at a table and used an Xacto knife with a 1/2 inch oblique blade for chip carving. She chipped 1/2 inch triangles according to a predrawn design from a 3 x 4 inch basswood block. A sound timer rang at 5-second intervals to control the rate of activity of the subject. The alveolar gas samples during rest and relaxed sitting were collected at 15 seconds after five breaths and at 23 seconds after three additional breaths. The interval for rebreathing is long enough in this set of experiments during the supine resting and sitting that recirculation may have occurred, thus the cardiac output is probably slightly low. The patient began chip carving several minutes before oxygen consumption was recorded. The oxygen consumption was recorded for 6-minute periods followed by rebreathing from the 5-liter acetylene-oxygen bag with alveolar samples taken at 9 seconds after three breaths and 18 seconds after three additional breaths.

Platen Press Printing: The subject stood at a platen floor press that was operated with a foot pedal and printed 4 x 6 inch cards at the rate of one card per 5 seconds. In order to carry out the activity, the subject depressed the foot pedal that activated the press four times in each 5 seconds. As the platen approached the chase the first time, the subject placed a card on the platen with the right hand and pushed the throw lever forward with the left hand. As the platen approached the chase the second time, the subject removed the printed card with the right hand and pulled the throw back with the left hand. This activity required the subject to balance on the left foot as she pedaled with the right foot and to use both hands in a co-ordinated sequence of activity of inserting the card, pushing the throw lever forward, removing the card, and pulling the throw lever back. Control metabolism and cardiac output were determined with the subject in the supine position after 30 minutes of rest and following 30 minutes seated in a straight-backed chair. The metabolic and cardiac requirements of relaxed standing were

not determined as controls for this activity, although such determinations would have been desirable. For evaluation of cardiac output during rest, alveolar air samples were taken at 15 seconds after five breaths and at 23 seconds after three additional breaths. The subject began the printing activity several minutes before the measurement of oxygen consumption in order to achieve a steady state. Oxygen consumption was determined over a 6-minute period and

cardiac output immediately thereafter. During the rebreathing in the course of printing, the alveolar air samples were collected at 9 seconds after three breaths and 18 seconds after three additional breaths.

Floor Loom: The subject sat on a 26-inch loom bench before a two-harness floor loom strung with cotton carpet warp. The wool was 3-ply cotton rug roving. A 21-inch shuttle filled with the same material was used. Weaving was

Table 1: The Effect of Posture on the Cardiac Output of Normal Young Subjects as Measured by the Grollman Foreign Gas Technic.

Posture	No. Subjects	No. Tests	Cardiac Output, Liters/Min.	S.E.M.*	% Increase over Supine
Supine	12	126	4.15 \pm 1.54	0.14
Sitting in chair	6	59	3.79 \pm 0.83	0.12	-9
Sitting on edge of bed	3	19	3.81 \pm 0.94	0.22	-8
Reclining at 45°	6	59	4.59 \pm 1.04	0.14	8
Getting out of and into bed	3	17	5.98 \pm 1.63	0.46	44

* Standard Error of the Mean.

Table 2: The Effect of Posture on the Metabolic Demand of Normal Young Subjects.

Posture	No. Subjects	No. Tests	Metabolic Demand Cal/M ² /Min.	S.E.M.*	% Increase over Supine
Supine	12	126	0.57 \pm 0.06	.006
Reclining at 45°	6	60	0.58 \pm 0.06	.007	2
Sitting in a chair	6	53	0.60 \pm 0.08	.011	7
Sitting on edge of bed	3	19	0.63 \pm 0.06	.014	11
Standing	16	47	0.67 \pm 0.08	.012	19
Getting out of and into bed	3	17	0.94 \pm 0.07	.017	64

* Standard Error of the Mean.

Table 3: The Effect of Selected Occupational Therapy Activities on the Cardiac Output of Normal Subjects.

Activity	Posture	No. Subjects	No. Tests	Cardiac Output, Liters/Min.	S.E.M.*	% Increase over Supine
Recumbent	Supine	12	126	4.15 \pm 1.54	0.14
Leather stamping	Sitting	2	21	4.61 \pm 1.30	0.29	11
Chip carving	Sitting	5	32	4.78 \pm 0.83	0.10	15
Leather tooling	Sitting	4	15	4.82 \pm 1.65	0.43	16
Leather tooling	Bed at 45°	4	24	5.13 \pm 1.67	0.34	24
Printing press	Standing	5	21	6.66 \pm 1.49	0.31	60
Floor loom weaving	Sitting	2	18	7.05 \pm 2.09	0.49	70
Bike grinder	Sitting	2	25	9.87 \pm 2.28	0.48	138

* Standard Error of the Mean.

done at 1 pick every 15 to 20 seconds. Each pick was beaten three times, using the right hand on the beater and holding the shuttle in the left hand. Control tests of oxygen consumption and acetylene uptake were made after the subject had been supine on a physical therapy plinth for 30 minutes and after sitting in a straight-backed armchair for 30 minutes. Alveolar air samples were collected during the acetylene rebreathing at 9 seconds after four breaths and 18 seconds after three more breaths.

Bicycling: The subject was seated on a stationary bicycle with a grinder attachment. Pedals were adjusted to suit the individual height of each subject. No additional resistance was added to the grinder. Pedaling was regulated by a 5-second metronome to one complete revolution every 5 seconds. The bicycle grinder used had considerable friction and inertia so that this constituted moderately heavy bicycling exercise. Control metabolism and cardiac output were determined before the bicycling after the patient had lain on a physical therapy plinth for 30 minutes and again after sitting in an armchair for 30 minutes. The oxygen consumption was measured during work after a steady state had been reached following 3 or 4 minutes of pedaling. Alveolar air samples were collected during acetylene rebreathing after four breaths at 9 seconds and three additional breaths at 18 seconds.

Results

The effects of posture on cardiac output are shown in table 1. Supine lying is usually considered to be a basal condition; however, insofar as cardiac output is concerned, there has long been a controversy whether or not the cardiac demand is lower when a person is lying supine or when sitting.^{2, 5, 6} Our data support the contention that the cardiac output when a person is sitting with the feet dependent is slightly lower than when he is lying supine. When the subjects sat in an armchair with arm and back support and the feet dependent on the floor, the cardiac output averaged 3.79 ± 0.83 liters per minute or 8.6 per cent less than when lying supine (4.15 ± 1.54

liters per minute) although the oxygen consumption was increased by 6.6 per cent (table 2). When the subjects sat on the bed with the back unsupported and the feet resting flat on the seat of a chair, the metabolism was increased 11 per cent over the supine position but the cardiac output was 8.2 per cent less (3.81 ± 0.94 liters per minute). On the other hand, when subjects lay on a bed with the back rest raised to a 45 degree angle and the knee rest raised to 45 degrees, the metabolism was increased only 3 per cent above the supine basal level, but the cardiac output was increased 8.4 per cent over the supine position or 17 per cent over the cardiac output when the subjects sat in an armchair.

One of the early activities that a patient with cardiac disease performs during recovery is to get out of and into bed. When this activity was carried out slowly as might be done by a debilitated or weak patient the mean increase of cardiac output was 44.1 per cent above that when lying supine and the metabolism was increased 64.4 per cent above the metabolism when supine. It should be emphasized that this is a phasic activity with high transients of energy consumption during the moment of rising from a sitting to a standing position. Therefore the value of the mean cardiac output throughout the cycle is deceptively low with regard to the peak demand placed on the heart. If it is valid to use the mean acetylene uptake and the variations of oxygen uptake to calculate the fluctuation of cardiac output throughout the cycle of getting out of and into bed, figure 1 indicates the range of cardiac output during this activity.

A study has been made of the influence on cardiac output of various activities used in occupational therapy (table 3). Not only the activity but also the posture assumed during the activity will influence the work of the heart. Leather stamping while sitting in a straight-backed chair requires a mean cardiac output of 4.61 ± 1.3 liters per minute. Chip carving while sitting causes a mean cardiac output of 4.78 ± 0.83 liters per minute. Leather tooling while sitting requires a mean cardiac output of 4.82 ± 1.65 liters

per minute. Leather tooling while reclining in bed with the back rest and knee rest at a 45 degree angle requires a slightly higher cardiac output than when sitting. The mean cardiac output during leather tooling while semireclining was 5.13 ± 1.67 liters per minute or an increase of 7.6 per cent over that of leather tooling while sitting. The cardiac demand of activity at the printing press was 6.66 ± 1.40 liters per minute. Weaving on the floor loom required a mean cardiac output of 7.05 ± 2.09 liters per minute. Pedaling a bicycle grinder required a mean cardiac output of 9.87 ± 2.38 liters per minute.

Discussion

Not a great deal of study has been devoted to determining the effect on the heart of various types of normal activities. Most studies have been made on normal or abnormal hearts during rest or some standardized condition of exercise. Because of technical requirements during the measurement of cardiac output it has been difficult to test the various activities carried on by patients in the hospital or persons leading sedentary lives. Physiologists interested in the work of the heart have wanted to know the range of cardiac capacity. Cardiologists have usually been more concerned with the problems of valvular inefficiency or demonstration of abnormalities than in attempting to control cardiac work by regulating activity in a quantitative manner.

Recently it has been advocated that cardiac patients be allowed to sit in a chair early in the course of recovery from coronary thrombosis.⁸⁻⁹ Although this has been viewed with alarm by some physicians, the statistics for this method compare favorably with those for prolonged bed rest. The data on cardiac output in this and previous studies indicate that there is less cardiac demand when the patient is sitting with his feet dependent than when he is supine.^{3, 5, 6, 10} Clinical observation also supports this finding. The patient with cardiac embarrassment wants to sit with his feet dangling. To place such a patient in a semireclining position with the back rest

and knee rest up may decrease his muscular activity very slightly but increase his necessary cardiac work approximately 15 per cent. Minimal cardiac and metabolic demands occur when the patient is seated in an arm chair with back and head supported and the feet comfortably supported on the floor. The data in this study of the cardiac demand of moving without aid from bed to chair and back indicates a higher cardiac requirement than would be necessary if the patient were assisted to sit and to stand. Although these latter measurements have not been made, it is likely that movement from bed to chair, if done carefully and with assistance, places little demand on the heart.

It is a maxim of medicine that an injured organ should be put at rest so that it may recover more quickly. For many years it has been assumed a priori that the recumbent position is the position of least activity for most or all organ systems. This position is referred to as "basal," although that term in actuality only applies to oxygen consumption by the voluntary muscles. The orthopnea of the cardiac patient is usually explained on the basis of changes in the mechanics of respiration rather than on the work requirements of the heart itself. It now appears that the orthopneic position is the position of minimal cardiac work as well as the position of greater ease of respiration.

Although it would be desirable to maintain the severely damaged heart at a condition of minimal or basal work for a number of days to allow recovery, this cannot be done. The activities of digestion and elimination must continue. Emotional stresses due to fears about illness or death, or concern over job, family, or future must play a role in determining the level of cardiac output.^{8, 11} The patient will move in bed to drink or eat, or from discomfort, boredom or anxiety. If he is maintained on enforced "complete rest,"¹² these factors probably become more prominent; as a result, the cardiac work increases.

For bed-bound patients a change is a rest in that it allows relaxation to occur. To carefully move the patient from bed

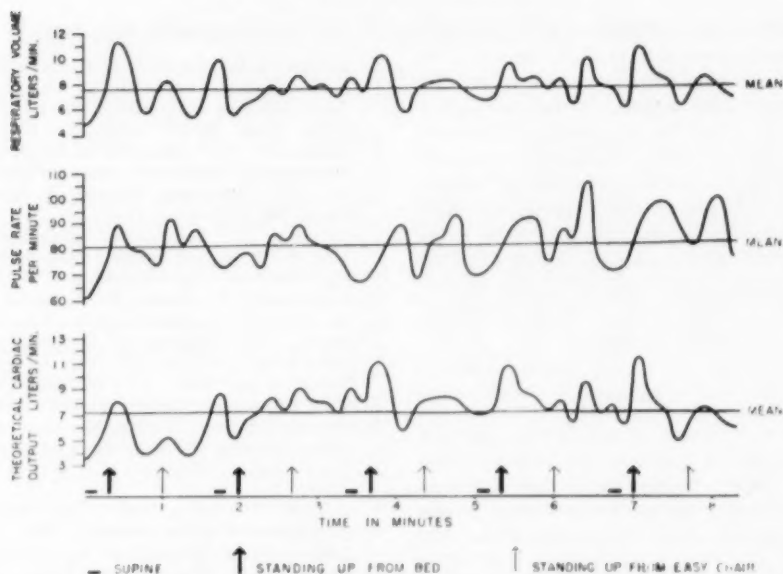


Fig. 1 — Continuous record of cardiac output, pulse rate, and respiratory minute volume of a normal subject moving slowly from a supine position in bed to sit on the side of the bed, step down to the floor, sit in an easy chair, stand, and return to bed. The activity was repeated throughout the period of the test. The cardiac output was calculated from the continuously recorded oxygen consumption and the acetylene uptake at the end of the period of activity.

to a comfortably supporting armchair places him in a physical position of minimal heart work and also helps to relieve emotional tension. The chair position assumed several times a day therefore keeps the cardiac output closer to the minimal level than does absolute bed rest. To assist in relieving emotional tension and anxiety, diversional activities such as reading or occupational therapy crafts requiring the use only of the hands are valuable. The activity allows the patient to forget his problems and results in a decrease of tension. The lightest crafts that require use only of the hands increase the cardiac requirement about 15 to 20 per cent. It is probable that anxiety exerts on the heart a much greater driving force than this.

It is extremely difficult to evaluate the influence on the heart of phasic activities during which there is a momentary increase in energy demand. To what extent these transient changes influence cardiac output is not known. Figure 1 indicates that standing unassisted from a sitting position probably increases the drive on the heart greatly due to suddenly increased metabolic demand. Lying

down also may increase cardiac output momentarily because of transiently augmented venous return. Since we were unable to obtain the acetylene absorption during these periods of change and had to make our calculations from acetylene uptake after a prolonged period of activity, it is reasonable to presume that the calculated values of cardiac output do not represent the full fluctuations of cardiac output due to this work. Sitting up unaided from recumbency or rising unaided to a standing position must be presumed to be activities that put a severe strain on the heart. For these activities cardiac patients need help. It may well be that these transient periods of very high cardiac demand as the patient moves in bed, reaches to the bedside table, sits up alone, or stands up alone may overtax the myocardium and result in further damage or death. Protection against these sudden severe stresses with provision for slow changes requiring little increase of cardiac work probably produces the lowest level of cardiac activity that can be maintained. Both the drive of muscular effort and the drive of emotional stress must be avoided if the heart

is to be protected against work. During convalescence the gradual addition of activities requiring progressively greater cardiac work appears to be the logical way to restore the myocardium to normal levels of function. During this period of recovery controllable activities of known metabolic and cardiac demand are valuable to help to condition the heart. Since activities in occupational therapy can be quantitated and controlled, they appear to be ideal for the purpose of rehabilitation of cardiac patients.

Summary

The cardiac demands of bed activities and light activities in occupational therapy were studied on normal subjects. The cardiac output while the subject was sitting in a chair or on the side of the bed was slightly lower than that when she was lying supine, and the cardiac output when the subject was reclining with the back rest and knee rest up was slightly increased. The cardiac requirement to get out of or into bed showed high and low transients when this movement was carried out unassisted, but probably does not demand a great deal of myocardial work if done slowly with assistance. Occupational therapy using primarily hand motions increased cardiac output very little. Standing to use a printing press or sitting at a floor loom increased cardiac output 60 to 70 per cent. Riding a bicycle with slight resistance increased the cardiac output approximately 140 per cent. These activities, because they can be controlled, offer an excellent means of gradually reconditioning patients with cardiac disease.

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Muscle Shortening Produced by Ultrasound

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It has been known for a long time that alterations in the ionic environment of the muscle cell can result in localized partial depolarization of the membrane and contracture.^{1,2} In several studies ultrasound has been shown to produce changes that presumably exerted their effect at the membrane level, such as decreases in membrane potential³ and in muscle phosphocreatine.⁴ Furthermore, in recent experiments on denervated muscle, ultrasound produced changes in ions and proteins which resembled, in some aspects, those produced by electrical stimulation.⁵ Because of this, it was felt that ultrasound might be able to produce localized areas of shortening in muscle, and it was with this in mind that these experiments were carried out.

Methods

The experiments were carried out on *Rana pipiens* during the winter months. Immediately after high-level cord section, a strip of the sartorius was placed in degassed Ringer's solution, either directly or after treatment in various manners. The muscle strip, after a half-hour period of rest in the Ringer's solution, was then exposed to continuous ultrasound at a frequency of 1 megacycle per second and at average intensities varying from 0.08 to 1.20 watts/cm². In a few experiments the muscle was exposed to infrared radiation from a 250 watt bulb. Length and tension were constant during the 30-minute test period, or, in several experiments in which this was studied, for periods up to 75 minutes.

In the first group of experiments isometric tension developed by the sartorius was recorded. One end of the sartorius was clamped, while the other was attached to a strain gage whose output was coupled to a Leeds-Northrup D. C. amplifier. In the remainder of the experiments isotonic shortening was measured, with one end of the muscle fixed, and the other attached to a lever that amplified movement 16.93 times.

Results

Isometric Tension (14 Experiments):

Isometric tension observations were carried out with the Ringer's solution temperature at 21.0 C., and with a distance of 2.53 cm. from the sound head to the muscle. The mean cross sectional area of sounded muscle was 3.7 square millimeters. The average maximal tension produced by the muscle on exposure to ultrasound was 2.3 gm. \pm 0.365 (S. E. of the mean) ($p < .001$). The intensity at which this maximal tension was produced varied considerably. In four experiments only 0.08 watt/cm² was required, and there was no greater tension with more intense ultrasound. In one observation maximal tension was developed only at an intensity of 1.2 watts/cm².

The pattern of tension development also varied considerably. On the average it took 2 to 3 minutes at one intensity for peak tensions to be reached. Invariably, this maximal tension was not maintained, and the level declined gradually even while sounding continued. Finally, after sounding was stopped there was further decline in tension, but this did not reach control levels during the period of observation (10 minutes after sounding was stopped).

Isotonic Shortening in the Ultrasound Field (18 Experiments):

Experiments on isotonic shortening were carried out at 22.1 C., with a distance of 2.57 cm. from the sound head to the muscle. The average length of muscle sounded was 1.26 cm. The mean maximal shortening was 0.45 mm. \pm 0.077 (S. E. of the mean) ($p < .001$). The quality of the shortening was similar to that of tension development, with slow onset, slow development, and return toward normal with sounding continued. One difference from tension studies was that in no instance did maximal shortening occur at intensities below 0.60 watt/cm².

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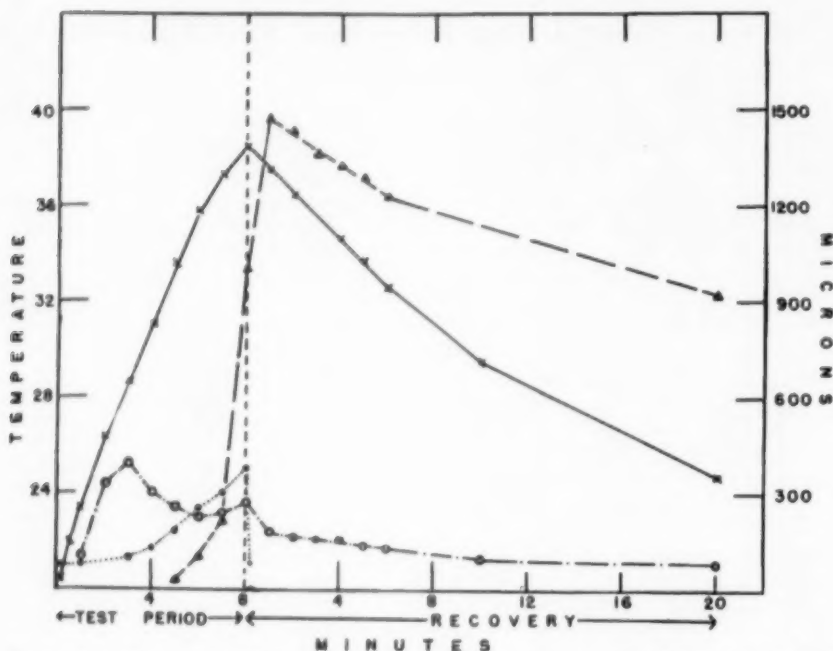


Fig. 1—Comparison of shortening produced in muscle by ultrasound (open circles) and by infrared radiation (triangles) during 8 minutes of exposure and 20 minutes of recovery. The amount of shortening, in microns, is indicated on the right ordinate. The left ordinate indicates the muscle temperature, in degrees centigrade, in the ultrasound field (closed circles) and in the infrared field (crosses).

Radiation Pressure: Although the slow changes in tension development or in shortening noted with muscle did not resemble the rapid effects of radiation pressure, it was felt desirable to directly measure the mechanical effects of radiation pressure in rubber, a substance that resembles muscle in many respects, as far as elasticity is concerned.⁶ Rubber strips 1.09 cm. long, 3.2 mm. wide, and 0.7 mm. thick were sounded at a distance of 2.48 cm. and a temperature of 23.2°C. Maximal apparent shortening, at 1.2 watts/cm², was 0.018 mm., far smaller than that noted with muscle. Furthermore the change was instantaneous when ultrasound was turned on, and the return to normal was immediate when ultrasound was turned off.

Further evidence differentiating between the ultrasound effect described and a radiation pressure effect was obtained by the application of known mechanical forces. At 1 watt/cm², the mean ultrasound unidirectional pressure is 149 mg./cm², with a peak of approximately 298 mg./cm² with the generator used.

With the sartorius fixed for isotonic recording, a weight of 282 mg. was applied so that it exerted a pressure of 7050 mg./cm² at right angles to the long axis of the muscle. Apparent shortening under these circumstances was 0.053 mm.

Thus, the purely mechanical effect of ultrasound on muscle, in terms of radiation pressure, seemed to be ruled out as a factor in producing this shortening, since radiation pressure per se produced changes that were far smaller in magnitude, and qualitatively much different.

Thermal Factors: The question next to be decided was whether the shortening noted was essentially a thermal denaturation. In 10 experiments the sartorius was sounded at an intensity of 1.0 watt/cm² for 8 minutes and temperature was recorded with a copper constantan thermocouple, while in 10 others isotonic shortening was recorded under similar conditions of sounding. Similar studies were carried out with infrared radiation in 12 experiments. As noted in figure 1, significant shortening in the ultrasound field was first noted at a time

when the temperature of the muscle was approximately 21.0 C. At this time no significant temperature rise could be noted. At the time maximal shortening was reached the temperature rise was only 0.3 C.

With infrared, on the other hand, shortening was first apparent when the temperature of the muscle reached approximately 36.0 C. As the temperature approached 38 C. there was sudden, marked shortening which continued even after the infrared radiation was discontinued. The differences between the ultrasound and infrared radiation were so great that it was strongly suggested that the shortening was not a thermally induced process.

Membrane Effects: In six experiments the sartorius was treated with 50 per cent glycerol at 5 C. for 24 hours, thus destroying the membrane and stopping excitability, but still retaining contractility and response to ATP (adenosine triphosphate). These glycerinated fibers were then exposed to continuous ultrasound in degassed Ringer's solution, at intensities up to 1.20 watts/cm², and isotonic contractions were recorded. The average shortening was 0.003 mm., a change that was completely insignificant. This fiber, although unresponsive to ultrasound from the standpoint of shortening, was still able to contract markedly on the addition of ATP. Yet, because some shortening did take place during the glycerination, so that the average length of the fiber was 0.90 cm., and the average cross section was 5.6 square millimeters, further evidence was sought.

Effect of Constant Current: Experiments on the effect of constant current are included because, although completely inconclusive, they showed how easy it could be to come to erroneous conclusions. It had been shown previously that contracture could be affected by a constant current.¹ If the ultrasonic shortening were of the nature of a contracture based on a membrane effect, galvanic current should be able to modify this shortening. In 14 experiments fresh sartorius was taken, one end fixed to a hook that was insulated except at the very tip, while the other end was attached to the isotonic lever. Another

electrode was placed in the Ringer's solution, approximately 5 mm. from the muscle. In some experiments the hook was the anode and the outside electrode was the cathode (cathodal current). In these observations a current flow of approximately 5 ma. took place for 2 minutes before ultrasound was begun and this flow continued during the sounding period. The shortening produced under these circumstances was a little greater than that produced without current flow, but the results were not at all conclusive.

When the hook was the cathode and the outside electrode the anode (anodal current), and 20 ma. current flowed for 2 minutes before sounding and during sounding, the results were qualitatively different. The amount of shortening was significantly less with anodal current than without current. This seemed to confirm the membrane effect of ultrasound. Further experiments were run, however, in order to determine intensity of the ultrasonic field with constant current. It was found that, as soon as anodal current began to flow, the ultrasonic intensity decreased quickly and markedly. One could thus not compare ultrasonic effects without current flow and with anodal current flow.

Effect of Cocaine. In 17 experiments, the sartorius was exposed to 2 per cent cocaine for 20 minutes (cocaine dissolved in Ringer's solution with enough sodium chloride removed to make the solution isotonic). At the end of this time the muscle was exposed to ultrasound under conditions similar to those used previously. There was absolutely no shortening in the ultrasonic field. If the cocaineized sartorius, unresponsive to ultrasound, was then exposed to ATP at a 1 mM. concentration, in a medium of 0.005M magnesium chloride plus 0.1M potassium chloride at a pH of 9.0, there was a consistent shortening of at least 1.5 mm. (mean muscle length, 1.21 cm.).

Discussion

Ultrasound, under conditions and at intensities that minimized or prevented cavitation, was able to produce shortening of the striated muscle of the frog. Furthermore, this was achieved with a very small temperature rise, and differed

completely from the thermal denaturation accompanying infrared radiation.

The type of contraction, from the standpoint of intensity and time relations, did not resemble the contraction occurring with a propagated action potential, since it was much smaller and developed much more slowly. Nor have propagated potentials been observed in electrical studies of muscle and nerve in the ultrasound field.^{3,7} The contracture, on the other hand, is a contractile response which is prolonged, reversible, and non-propagated.⁸ The contracture is produced by any agent that can result in a certain level of membrane depolarization, and can be suppressed by the repolarizing effect of anodal current. This shortening is not maintained in phasic muscles like the frog sartorius, which relax spontaneously even while membrane depolarization continues.⁸

Many of these situations were duplicated by the preparation exposed to ultrasound. Unfortunately, the observations with anodal current were not conclusive because of the change in effective ultrasonic intensity during the period of current flow. Not only does the ultrasonic shortening resemble contracture in the more superficial aspects noted previously, but it is similar in its dependence upon membrane effects. It was shown in previous studies that ultrasound resulted in a decrease in injury potential from 48 to 30 millivolts, with some return towards normal and a final level of approximately 36 millivolts after sounding was stopped.³ Such a decrease was not produced by infrared radiation even though similar temperature levels were apparently reached.

Further evidence relating to membrane effects of ultrasound was provided by experiments that demonstrated that chronaxie and action potential were affected in a manner other than thermal.⁹⁻¹¹

Effects on phosphocreatine too were strongly suggestive of a membrane effect, since the decrease in phosphocreatine produced by ultrasound was of the same order of magnitude as that produced by depolarizing agents.⁴ Furthermore, once the membrane was destroyed, as by

glycerol, or blocked against action of depolarizing agents, as by cocaine, ultrasound no longer produced a decrease in phosphocreatine.

In the central nervous system, too, membrane effects, presumably, expressed in terms of marked increases in excitability at very low levels of ultrasound, could be demonstrated.⁷ At no time was there any action at a distance, except indirect, or a propagated action potential.

Finally, in this study, the shortening produced by ultrasound could be completely prevented by glycerol or by cocaine, two drugs that exert their effect predominantly at the membrane level. At the time that ultrasound shortening was no longer apparent ATP, which acts mainly on the contractile mechanism, still produced marked shortening.

It is possible that these observations may be related in some way to those obtained by Fischer and co-workers in their studies with denervated rabbit striated muscle.⁵ In those studies it was noted that repeated small doses of ultrasound resulted in slight retardation of weight loss, decrease in sodium and increase in potassium, collagen, noncollagenous protein, actomyosin, and ATP activity. Such changes following stimulation of denervated muscle electrically have been related to contraction and the development of tension. Although the tension developed with ultrasound is far less than that noted with electrical stimulation, it is speculated that the effects noted in this study may be responsible, in some way, for the beneficial effects of ultrasound on denervated muscle.

Summary

Frog sartorius exposed to ultrasound, *in vitro*, shortened and developed small amounts of tension. This was not related to thermal changes or to radiation pressure effects *per se*. Glycerol and cocaine, a membrane stabilizer, prevented the shortening of striated muscle produced by ultrasound. It is postulated that the shortening is of the nature of a contracture, depending upon membrane changes produced by ultrasound.

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SUCCESS IS THE KEYNOTE

of our meeting this year! An interesting and scientific exhibit will contribute much to our success. In addition to the tremendous value of these exhibits, YOU have the opportunity to be considered for one of the coveted awards. Requests for applications for scientific exhibit space in connection with the 35th annual session scheduled for September 8-13, 1957, Hotel Statler, Los Angeles, are now being received. Address all communications to the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, Illinois.

Eastern Section Plans Meeting

The Eastern Section of the American Congress of Physical Medicine and Rehabilitation will meet at the Kessler Institute for Rehabilitation, Pleasant Valley, West Orange, N. J., on Saturday, April 27, 1957. For complete details, write to the Secretary, Elmer J. Elias, M.D., 474 Greenwood Ave., Trenton 9, N. J.

Upper Extremity Pylon: Case Report on a New Device for Facilitating Crutch Walking

Jack L. Linden, M.D.
White Plains, N. Y.

A 46-year-old white male laborer of excellent physique, who was caught in a paper baling machine, sustained the following injuries: compression fractures of T11, T12, and L1 with resulting paraplegia (level of T10), including paralysis of the bladder, and multiple fractures of the left forearm with resulting non-union and Volkmann's contracture. Prior to admission he had been treated for 2 years for urinary complications, decubital sores, and skin ulcers, as well as for transient mental complications, possibly concussion syndrome. He received physical therapy and was issued bilateral long leg braces with pelvic band, spinal support, and corset attachments. His optimal activity was standing in the parallel bars with good balance and tolerance with all the joints of his braces locked. Since the patient was able to use only the right hand for grasp, ambulation was not attempted.

On admission to this hospital, the patient was able to transfer from his wheelchair to bed, using a removable arm rest, but he required full assistance in getting into his braces. His left shoulder, upper arm, and the proximal half of the forearm were viable and powerful. Below that level the extremity was dry and rather useless, with only limited motion in the fingers. There was an angulation in the mid-forearm toward the flexor plane of about 15 degrees with wrist flexion at 25 degrees, hyperextension of the fingers, clawing of the ungual phalanx, and adduction of the thumb. The patient wore an indwelling catheter.

Prognosis for optimal rehabilitation was evaluated when the patient's skin condition was cured and he was fit to use his braces. It was decided that his level of spinal injury would permit ambulation with crutches, but the angulation of the left forearm as well as the loss of functional grip in the left hand

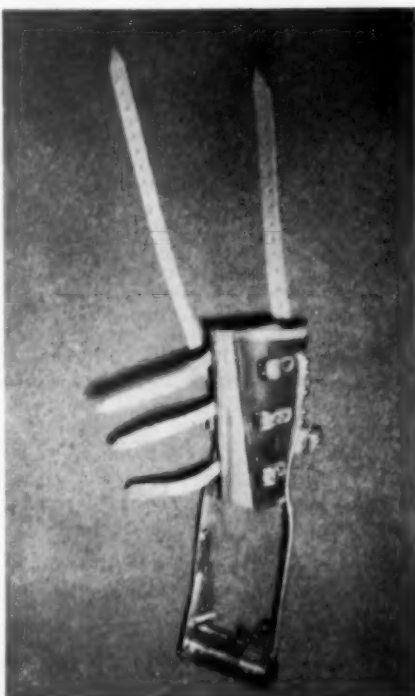


Fig. 1 — Device with the spring clamp closed. Additional (long) straps are used for more solid contact with the crutch.

excluded the possibility of any push-up exercise.

Previously, an amputee who lost one leg and one hand on the same side had been successfully trained in crutch walking using his prosthetic arm, with conventional hook, as a "pylon." The only requirement was to replace the crutch handle with a simple iron bar with a lateral knob, which allowed the patient to perform full push-ups (a spring band was attached for crutch lifting). Since the patient refused a mid-forearm amputation and prosthesis, the consultant orthopedic surgeon was requested to con-

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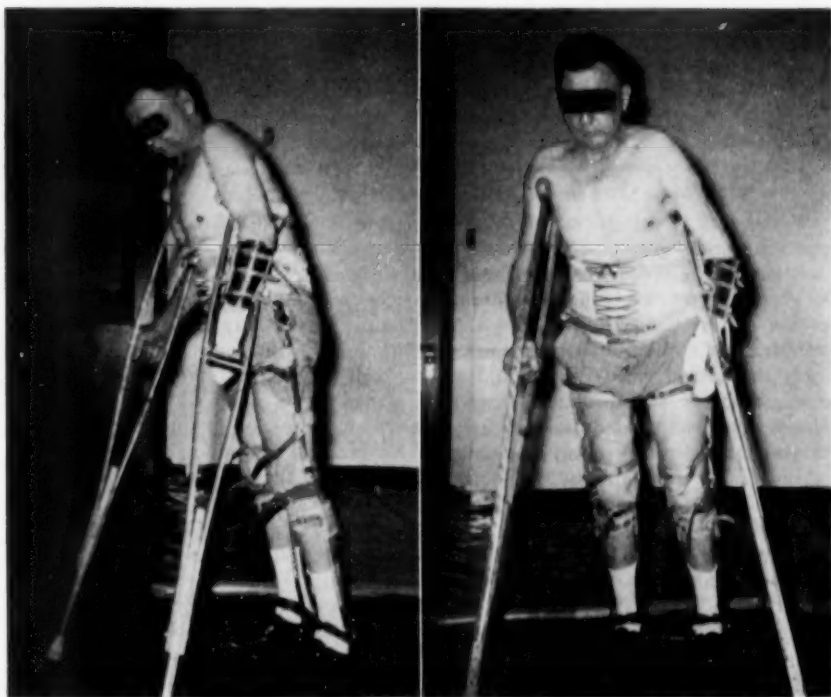


Fig. 2, 3 — Using the device for ambulation. Patient's hand is bandaged and "dipped" toward the body, thus circumventing the damaged distal part of the limb.

sider a fusion of the patient's wrist in 45 degrees of dorsi-flexion, which would allow the patient to use the hand for apposition even if useless for any other purpose. The operation was performed, but the wrist was fused in a neutral (180 degree) position which, with the angulation in the forearm, was unfortunately insufficient for any functional use.

On subsequent re-evaluation it was decided to construct a "push-up" pylon consisting of a leather forearm cuff with straps, buckles, and a double bar brace terminating in a clamp that could be tightly attached to the crutch handle and also used in the open position for parallel bar exercise (fig. 1). This clamp was padded with corrugated rubber for

tighter grip. The main purpose of the device was to direct the weight bearing to the healthy upper half of the forearm.

On the first trial the patient was instantly able to do his push-ups on crutches with this device. An ankle spreader and a few corrections to his braces were also needed. The patient initially required partial assistance for balance, but later began to improve rapidly. At present he has fairly good endurance and is doing drag-to and swing-to gait pattern exercises twice daily. He is being trained to put on his braces independently. The patient, who previously had shown signs of apathy, has become alert and well motivated and is proud of being reclassified as an ambulatory patient (fig. 2, 3).

Physiatry and the Vocational Rehabilitation Program

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Young as it is, the specialty of physical medicine and rehabilitation already has two landmarks of major importance in its growth. The first is the establishment of the Armed Forces and Veterans Administration rehabilitation programs to meet the urgent need during and immediately after World War II, and the almost concurrent extension of this type of program to the civilian population, within the limits created by the shortage of trained personnel. There has been a progressive expansion of physical medicine since.

The second landmark, which provided a further impetus to its development, was the amendment in 1954 of the Vocational Rehabilitation Act. The full significance for physiatry of this act can be appreciated only if the federal-state program of vocational rehabilitation for the disabled and its operation are well understood. For the physiatrist, who is frequently closely involved, this is a necessity.

Realization of the need for returning the disabled to productive employment resulted in the passage of the original Vocational Rehabilitation Act of 1920. Under that act, the federal-state program consisted largely of guidance, training, and placement for handicapped individuals. The main technic was to train around the disability. The states were, and are, responsible for services, with the Office of Vocational Rehabilitation assisting through grants-in-aid, administration, co-ordination, consultation, and leadership. Vocational rehabilitation programs are in operation in every state.

In 1943, in view of the great strides in medicine and surgery and the obvious necessity for physical restoration, amendments were passed that put the civilian program solidly on a platform of medical services as a major factor in rehabilitation. Any person of employable age with a physical or mental handicap to employ-

ment is eligible for counseling, training, and placement services, provided there is a reasonable expectation that such services can render him fit for remunerative employment. Any eligible person whose disability, which must be stable or only slowly progressive, can be reasonably expected to be removed or reduced in a reasonable period of time, is also eligible for physical restoration services at public expense to the extent that he is not able to pay for them. These include such services as treatment and prosthetic and orthopedic appliances.

The 1954 amendments¹ opened wide new avenues for a progressive expansion of the vocational rehabilitation program in order to carry out more effectively its purpose — to return to the disabled their proper pride and dignity as self-sustaining men and women.

To attain the President's goal of a three-fold increase over the 55,000 to 60,000 persons rehabilitated annually, Congress authorized \$30 million for federal grants-in-aid to state agencies in 1955, as compared with an appropriation of \$23 million for 1954. It also authorized progressive increases to \$45 million in 1956, \$55 million in 1957, and \$65 million in 1958, and such sums as Congress may decide upon for each succeeding year. These sums are maximums; amounts actually appropriated are determined annually by Congress.

In addition to funds for services, provision was made for training personnel in the various disciplines involved in rehabilitation. The severe lack in these areas is one of the greatest hindrances to the

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The opinions expressed are those of the author and do not necessarily reflect the views of the Office of Vocational Rehabilitation.

expanding program. Further, as a means of implementing these desired goals, a three-part grant system was devised.

The impact of these provisions on the field of physiatry has been considerable and can be made clear by examining the results of the program nationally in the last few years.²

Basic Support Grants

Basic support grants account for most of the funds appropriated and are used to help states meet the costs of administering their basic programs. Awards are made according to a matching plan based on population and per capita income.

The number of persons rehabilitated, that is, returned to productive employment through the state vocational rehabilitation agencies was 56,000 in 1954, and 58,000 in 1955. Indications are that, for the fiscal year 1955-56, the total number of persons thus returned to self-sufficiency and independence will be close to 66,000.

In 1955, these persons, whose ages range from 15 to 65 years and over, and whose average age at the beginning of rehabilitation was 34 years, increased their combined annual earnings from \$15 million annually before to \$105 million annually after their rehabilitation.

It is interesting that in 1944, 13.5 per cent of the 43,997 persons rehabilitated were given physical restoration. By 1954, this number had increased to 43 per cent of 55,825 and in 1955 to 43 per cent of 58,000.

This means that in 1955 more than 25,000 people (counting those given treatment but whose cases were not yet closed as of the year's end) received such services as treatment, prosthetic appliances, hospitalization, and convalescent care, for which \$8.9 million was expended by the state agencies.

At the end of June, 1955, 127,573 handicapped persons were still receiving services from the state agencies. It is probable that a large proportion of these have received physical restoration since then. The pattern of increase is obvious in the light of these statistics.

Of the various types of disability treated, 41 per cent, or almost half, were

of an orthopedic nature. Two fifths of these were of traumatic etiology and one fifth were disabled as a result of poliomyelitis, arthritis, or osteomyelitis.

The actual number treated by physiatrists is not known but, considering the conditions involved, it is obvious that they have much at stake in this program. A close working relationship with vocational rehabilitation agencies is both stimulating to the growth of the program and the field of physical medicine and rehabilitation, and highly desirable from the point of view of increasing the number of persons rehabilitated.

Several other facets that have an important bearing on physiatry are implicit in the other parts of the grant system.

Extension and Improvement Grants

Extension and improvement grants are awarded to the state agency on the basis of population for extension and improvement of service, that is, to increase facilities, to improve the quality of services, and to provide services to the disabled above and beyond those already available in the state. The federal share is not more than 75 per cent and may run for a maximum of three years on any one project. The state vocational rehabilitation agency in turn may grant federal funds together with state matching funds to public and private nonprofit organizations to expand their workshops or rehabilitation facilities. Application by the nonprofit organization is made to the state agency.

From June 30, 1955 to June 30, 1956, 104 such projects in 46 of the 51 states and territories had been approved for a total of approximately \$1,150,000 in federal funds (for partial support).

About one half of these projects was concerned with specialized counseling services or specialized programs for facilitating the rehabilitation of seriously disabled persons. A full quarter was concerned with the improvement of medical consultation and supervision methods, the development of organized programs for demonstrating the employment potential of the disabled, and research into techniques to aid in the rehabilitation of the

seriously disabled. The remainder was involved in the establishment or extension of sheltered workshops, rehabilitation facilities, or other activities.

The development of rehabilitation facilities and technics for the rehabilitation of the seriously disabled must impinge on the work of the physiatrist; some examples drawn from these projects will make even clearer the opportunities for expansion in the field of rehabilitation.

In New Jersey, a grant was awarded to the state agency, which used the funds to aid in the extension of facilities and services of a well-known rehabilitation center. Diagnostic services were increased and a prevocational unit was added.

In New York, a project was set up in co-operation with community agencies to evaluate in a rehabilitation center the potential for vocational rehabilitation of public assistance recipients.

Special Projects

Special-project grants are awarded to support part of the cost of research and/or demonstration projects that hold promise of making a substantial contribution to the solution of vocational rehabilitation problems common to the nation or to several states. These grants are open to public and private nonprofit agencies and institutions. Projects providing direct rehabilitation services to the disabled require approval of the state vocational rehabilitation agency. The sponsor must pay part of the cost, and the application is submitted directly to the Office of Vocational Rehabilitation. In making a decision on these applications, the Director takes into consideration the recommendation of the 12-member National Advisory Council on Rehabilitation, which reviews them.

As of the last meeting of the Council in May, 1956, a total of 57 projects had been approved and \$1,514,850 expended. Slightly less than one fourth of these (13 projects) directly concerned the field of physiatry.

Examples of this type of project are: the establishment of a demonstration rehabilitation center, the evaluation of the vocational potential of adults with cerebral palsy, search for effective methods

of rehabilitation of severely disabled persons in respirator centers, establishment of physical medicine and rehabilitation services as part of the program of a sheltered workshop and to show the increase in rehabilitation of the severely disabled, and determination of the extent to which a rehabilitation team can return the homebound disabled person to employment outside the home.

Another section of the clause relating to special projects provides for a system of expansion grants to nonprofit institutions. The authority for these expansion grants was initially scheduled to run for a two-year period and to expire on June 30, 1956. However, these grants resulted in so great an increase in such services as sheltered workshops and rehabilitation facilities that Congress extended the authority for another year (to June 30, 1957) and appropriated \$1 million to finance it.

In fiscal year 1955, 38 states developed expansion projects either as a direct part of the state agency's program or in co-operation with nonprofit organizations. The total amount granted was \$700,621.

By the end of fiscal year 1956, expansion grants totaled \$1,069,280 for 102 projects in 42 states and territories; 23 awards covered continuation grants for projects begun in fiscal year 1955, and 79 awards were for new projects. The great bulk of the 1956 awards was for the establishment and expansion of rehabilitation facilities and sheltered workshops—48 rehabilitation facilities including 15 speech and hearing centers and 37 sheltered workshops. The other 17 awards were for various programs, such as aid for the mentally retarded and the homebound.

Expansion grants have enabled various sponsors, among other things, to expand or develop physical medicine and rehabilitation services, to establish the team approach, and to expand these services to include disability groups not hitherto served.

Applications for these grants must be approved by the state vocational rehabilitation agency for any activity involving either direct services or the establishment of facilities that will render direct services to the disabled. The federal

share may not exceed two thirds of the cost of the project and matching funds must be provided by the applicant.

All of these activities have been a great spur to the development of rehabilitation facilities and technics — sheltered workshops, physical medicine and rehabilitation units, and centers. But aside from the direct involvement of physiatrists in the program as treating physicians, the most far-reaching effects on the field of physical medicine, both now and in the future, stem from the training program of the Office of Vocational Rehabilitation.

One of the greatest obstacles to a rapid increase in the number of persons rehabilitated annually has been the severe shortage of trained personnel. It is hoped that this situation will be substantially corrected as the result of teaching and traineeship awards.

In the fiscal year ending June 30, 1956, 104 long-term and 50 short-term teaching grants were made to institutions in areas such as medicine, nursing, social work, occupational and physical therapy, psychology, rehabilitation counseling, and rehabilitation center administration. Only the medical area will be discussed in this paper.

For fiscal year 1956, six teaching grants in medicine were awarded, for a total of \$89,396, to stimulate the teaching of rehabilitation in the medical curriculum and to aid in the establishment of residency programs in physical medicine and rehabilitation. For the fiscal year ending June 30, 1957, there are 10 teaching grants totaling \$168,921, including continuation grants for last year's awards. These grants may be used for such purposes as salaries for additional instructors or clinical teachers and teaching aids. The grantee must share the cost. No construction, alteration, or leasing of building is permitted with these funds. It is hoped that rehabilitation will become a standard part of the medical curriculum.

The traineeship program also holds promise for increasing the number of physiatrists. By June, 1956, 51 residents in physical medicine and rehabilitation had received awards, plus 3 residents working in rehabilitation in other medi-

cal fields. Residencies must be approved by the American Medical Association. There was thus a total of 54 residents and 21 institutions in the traineeship program, for a total cost of \$287,516 in fiscal year 1956.

For the year ending June 30, 1957, it is estimated that awards for 79 residents have been made at a cost of \$432,174, including the allotment of \$1,250 to the institution for each trainee. These allotments are to help defray costs incidental to the resident's training.

Traineeships range from \$3,400 per year for a first-year resident, to \$8,000 annually for persons with advanced training who are planning to enter the teaching field. These latter are limited in number. Awards are made to the institution, which must select its own trainees. The total amount spent thus far for fiscal year 1957 is \$601,095 and the program is growing.

Also of great interest to physiatrists is the authority given the Office of Vocational Rehabilitation by Public Law 565, 83rd Congress, to provide research fellowships to individuals who are securing advanced research training or carrying out independent research in rehabilitation problems or methods. It is expected that this program will be in operation soon.

An important collateral step in 1955 was the close liaison instituted with the Public Health Service to aid in the establishment of rehabilitation facilities as provided by the Medical Facilities Survey and Construction Act, Public Law 482, 83rd Congress.

To go into further detail on what these events mean for physiatry would be to belabor the point. Suffice it to say that these programs should increase the number of available rehabilitation facilities and physiatrists. But, perhaps more important, graduates of medical schools will understand what physical medicine and rehabilitation is and what it can do.

In this brief glimpse of the state-federal vocational rehabilitation program, it has become apparent that this program is closely allied with physiatry. That co-operation would be beneficial to both, there is no doubt; but much more im-

portant, such a symbiosis would carry us much closer to our common objective—the extension of rehabilitation services to every individual in need of them.

References

1. Public Law 565, 83rd Congress. Amendments to the Vocational Rehabilitation Act, 1954.
2. Annual Report of the Office of Vocational Rehabilitation, 1955, and unpublished reports from the state vocational rehabilitation agencies.

Discussion

Arthur C. Jones, M.D. (Portland, Ore.): The author is in a strategic position to discuss the relationship of the vocational rehabilitation program to the specialty of physical medicine and rehabilitation, since he has had an excellent background as a Fellow in this field, and is medical consultant to the Office of Vocational Rehabilitation. He has done a favor to all who are identified with rehabilitation in outlining the provisions of the Vocational Rehabilitation Act as amended. The purposes of the act are identical with those of this specialty, indeed with the very obvious goals of the entire profession of medicine—"to return to the disabled their proper pride and dignity as self-sustaining men and women."

Gradually through the years there has come an increasing realization on the part of all those who are charged with responsibility for any phase of rehabilitation that there must be a team approach to the many problems entailed in this process if valid results are to be achieved. The physician must evaluate degrees of disability and of ability, and prescribe in the areas of physical restoration. Medical

considerations must guide the entire team in selection of achievable vocational goals. On the other hand, the process of rehabilitation would be blocked in a great many cases were it not for the provisions that have been made for implementation of the work by society through local support of rehabilitation centers, grants of moneys by the states, and federal grants that have given workers in rehabilitation essential means toward the final goal of actual physical and vocational rehabilitation. Detailed understanding of all these facilities by the medical profession, and especially by the physiatrists of our country, is essential to the best use of these facilities—in research, in teaching of all rehabilitation workers, in expansion of hospital and rehabilitation center facilities, and in evaluation of realistic vocational training of patients and final placement. Certainly physiatrists have much at stake in this program, and must share in development of it in a pattern that is in our American tradition.

The discussant cannot refrain from one small note of correction. Forty-one per cent of the various types of disability rehabilitated in 1955 were listed as "orthopedic." Such a listing may be convenient, but is not really accurate, since it may include neuromuscular, skeletal, or neurological cases in which orthopedic surgery has little or no application. Physical medicine and rehabilitation is as much concerned with medical, neurological and even psychiatric problems as with "orthopedic" disabilities. Which even more points up the need for the physiatrist to work most closely with every agency concerned in our common goal—"the extension of rehabilitation services to every individual in need of them."

Geriatric Rehabilitation Program

The Greater New York District of the New York Chapter of the American Physical Therapy Association announces their annual Educational Institute to be given the evenings of March 7 and 8, 1957, at the New York Coliseum. Geriatric Rehabilitation will be discussed. Further information may be had by writing to Miss Rosann Borinstein, R.P.T., Educational Chairman, 135 E. 50th St., New York City.

Rehabilitation's Hidden Dimension

Willis C. Gorthy
New York City

In the scientific practice of rehabilitation, men and women of lay and professional qualifications work in concert to achieve a mutual goal. Together they seek to develop the maximum potential of the handicapped man, woman, and child, in order that these patients may enjoy lives of good will, well being, and accomplishment.

The community comprehensive rehabilitation center has developed as the kind of facility especially adapted to cope with the problems of the disabled. In the years just ahead this type of center will be established in ever-increasing numbers. This trend in rehabilitation-center development has been influenced by the recent enactment of legislation that not only encourages the development of centers with a wide scope of services but also provides essential income for the center through purchase of services for disabled clients of state rehabilitation agencies.

Professional and Administrative Activity

Three major spheres of activity are necessary to the successful operation of broad-scale community rehabilitation centers. Foremost is the area of professional performance. The second is routine administration, which copes with the business matters common to any endeavor. These two spheres of activity usually are clearly defined and generally seen in proper perspective within the rehabilitation center. The third activity is the subject of this report.

Role of Management

This third element as yet has not been clearly recognized although its presence is essential to the rehabilitation center's effectiveness. It is so little understood, and yet is so important to rehabilitation, that I think it is best described as "rehabilitation's hidden dimension"—the introduction and application of sound principles of management to the direction of rehabilitation-center effort.

Management is the technic used by an organization to achieve its stated goals with maximum utilization of personnel, facilities, and funds available. In a small organization, the need to follow the principles of good management, while applicable, may not be so apparent. Here, operations are characterized by the fact that it is possible for the individual in charge to be familiar with every detail of the operation and to give personal direction to it.

In an organization as complex as the comprehensive rehabilitation center, with its many diverse professional disciplines, which often are coupled with a wide range of business and industrial types of activities, the application of the principles of good management becomes essential. To ignore this fact is to run the risk of imperiling the center's position as an effective force in serving the disabled of the community. No single individual has the capacity to personally conduct all of the details of this kind of operation. Under these conditions the technics of management can be utilized to make the operation of the complex organization just as effective as that of a smaller one.

Complexity of Center Management

Few will deny that the operation of a comprehensive rehabilitation center is a complex matter. It deals with the most involved of human problems, the solutions to which require the application of the highest level of co-ordination of a number of professional skills.

The practical realities of the business world, as represented by employers of the handicapped, by compensation insurance companies, and by state rehabilitation agencies must be faced. At the same time, the personal and social problems of patients, many of whom will

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Director, Institute for the Crippled and Disabled.

never enter the labor force, must be dealt with adequately. Service must be provided not only for those who have the means to cover the full cost, but also for those on the welfare rolls who require a large measure of community support.

Add to all of this the problems involved in the administration of such diverse activities as a medical facility of wide but special scope, a vocational training effort, a broad program of teaching and research, a sheltered workshop competing with industry for subcontracts, and, perhaps, a mental hygiene clinic. Consider, too, the importance of establishing and maintaining effective relationships with professional, governmental, industrial, and other voluntary agency groups that so extensive an operation necessitates. When all of this is considered, then perhaps it can be appreciated that operation of a rehabilitation center presents management problems that go beyond even the broad areas of professional interest.

The Professional Team

It is an accepted fact that rehabilitation requires a high order of teamwork brought to bear upon the problem of the disabled patient. The professional team, of course, is the heart and soul of rehabilitation. Truly effective rehabilitation can be achieved only when the team is composed of competent and efficient members, when there are no major gaps in professional service, and when there are no permanent clashes in personalities.

The strictly routine administrative functions are arranged to complement the professional activity. While they must be conducted as efficiently as possible, they must also be geared to serve the needs of the professional staff. This type of administrative activity expedites professional service to the patient.

This service to the patient is what is often called "patient management." Rehabilitation-center management should not be confused with patient management, which clearly is a function requiring professional judgment. Management of a rehabilitation center comes under the heading of organization management. From many points of view, it is a specialty

in its own right. It draws upon basic skills and experience in such areas as program planning, finance, community relations, personnel administration, and many other skills that are not normally included in the training acquired by professional people in rehabilitation.

On the other hand, a comprehensive rehabilitation center cannot be operated with maximum effectiveness unless the professional staff members, particularly the heads of professional departments, are made a part of the management team and become familiar with and apply the principles of sound management. Most professional people, if given their choice, might prefer to devote their entire effort to applying their professional skills directly to help solve the problems presented by their disabled patients. It is inevitable that as a rehabilitation center grows in size and complexity, the heads of professional departments will be faced with more and more management problems that divert attention away from direct services to the patient. Just as these key professional persons form the nucleus of the treatment team so must they participate in the over-all management team to give leadership to the center's broad effort to enhance its professional programs and to establish its place in the community.

It is my purpose to outline some of the basic concepts of good management and to indicate how the professional person makes his contribution to this important aspect of the operation of a comprehensive rehabilitation center.

Phases of Center Management

Management of the center involves three major phases. The first is the development of the policies under which the center will operate. The second pertains to the day-to-day operations of the facility. The third, which somewhat overlaps the other two, involves the establishment of solid, effective relationships between the center and the community.

The head of each professional department within the rehabilitation center participates in management in three ways:

1. He recommends basic policy for conducting his professional specialty, including modifications necessitated by practical operating considerations, by teaching needs, and by research activity.

2. He directs his professional activity within approved policy and procedures as limited by available staff, space, and funds, and in accordance with accepted professional standards.

3. He establishes and maintains relationships with appropriate professional and other community groups.

Most rehabilitation centers in this country are chartered as voluntary, non-profit agencies with boards of trustees generally governing their activities. The board is vested with the function of determining the broad policies under which the center will function. Likewise, it is accepted practice to establish a medical board to develop the policies that govern the center's medical program.

However, to be realistic as to the process by which over-all policies are developed it must be recognized that policies that effectively meet the changing needs of the center must flow from the thinking of those in charge of the various professional departments through the center executive to the board of trustees.

Effective Policies

The policies that guide the operation of any organization form the basis for all of its effort. These policies need to be firm but not obstinate. In rehabilitation, particularly, they need to be reviewed constantly to keep pace with the ever-changing capacity of rehabilitation to deal more effectively with the problems of disability. As a corollary to this, it can be said that progressive, far-sighted policies form the groundwork for rehabilitation progress.

Policy determinations pertain to every aspect of the rehabilitation program. Some of the major matters that require the establishment of policy concern: (1) type of organizational structure, (2) scope of professional services, (3) size of patient load, (4) types of patients served, (5) sources of referral, (6) arrangement

of facilities, and (7) range of teaching and research.

The chief of each professional discipline in the center should develop and recommend the policy governing his professional area that is to be included in the general policy governing the center's operations. It must be stressed that the center's managing executive does not formulate professional policy. His function is to gather the recommendations made by the separate professions and to develop a unified policy for presentation to the board of trustees. This may be called the "conference-decision" technic in that it results in recommendations that are fully co-ordinated by all department heads working in concert.

Policy Planning

Of course, the telling is a lot easier than the doing. Many modifications in the policies initially recommended may need to be made before the final decision is reached. Shortages of funds may exist. A professional staff may not be available. Facilities frequently are lacking. Relationships with other agencies usually need to be developed, and conflicts between professions as to their respective areas of functioning often need to be resolved. This step in policy planning is important if the policies are to be adequate to meet the demands of day-to-day operations.

Policies must never be allowed to become inflexible. They must be reviewed continually to keep pace with the times, the nature of the caseload, and the funds and facilities available. Policy flexibility facilitates adjustment of the center's capacity to provide better and a wider range of services. In this, the professional department head has the responsibility for detecting the need for changes and for making policy recommendations that these changes demand.

Management in Daily Operations

The second phase of management concerns the actual operation of the professional area for which policy has been determined and responsibility has been assigned. This is wholly the responsibility

of the head of each professional department. The responsibilities of the professional department head in the rehabilitation center's day-to-day operation include:

1. Direction of the professional activities assigned at the highest possible level of professional competency.
2. Selection and effective utilization of the professional staff.
3. Selection, arrangement and use of equipment.
4. Development with the administrative staff of such broad administrative efforts as establishment and modification of effective operating procedures, budget preparation, collection of statistical data, etc.
5. Direction of all subordinate staff activities in accordance with general center personnel and employment practices.

The development of the procedural details in such a system must be of concern to the professional person. Here the administrative staff assists in assuring that the procedures are not overly complicated, that as much clerical detail as possible is handled by nonprofessional personnel, and that the needs of the strictly business aspects of running the center are met. Altogether, these efforts should result in a system that assures that the professional program prescribed for the patient is promptly executed and is reviewed at appropriate intervals.

Clearly, in this phase of management, the head of each professional department has an important role to play in assuring that administrative procedures contribute to the accomplishment of professional requirements. The administrative staff will function most effectively when it has a general knowledge of professional problems in rehabilitation. By the same token, the professional staff needs a general appreciation of administrative technics.

Relationships With Community Groups

The broad area of relationships with other groups and agencies is also the responsibility of members of the professional staff. These may be broadly classified as professional groups or associations, professional agencies, referral

agencies, and fiscal agencies. The professional staff member's participation in the development of stronger community relations is for the following purposes:

1. Professional groups—to assure better understanding of center functions and closer participation in center programs.
2. Referral agencies—to secure better referrals, early referrals, and more adequate historical data.
3. Professional agencies—to develop joint co-ordinated programs for center patients.
4. Fiscal agencies—to develop financial arrangements for services, research, and general support.

Some of these relationships are solely the responsibility of a single professional staff member. Others require joint participation by many people on the staff, including administrative personnel and the executive head of the center. Since the strengthening of these relationships with outside agencies frequently leads to changes in the nature of referrals and in the scope of service within the center, this activity is inherently a responsibility of general management. Constantly, policies will need review to meet the newly developed relationships, and subsequent changes in operating procedures will need to be considered.

The Center's Role in Teaching Research

Progressive rehabilitation-center management has an obligation to extend its activities beyond the treatment sphere. It should encourage the utilization of its staff and facilities for the teaching of professional students and others who desire further training, preferably in collaboration with a teaching institution in the community. Demonstrations for interested professional, business, and community groups are an essential area of rehabilitation-center community education. Like teaching, research is an important endeavor in many centers. The changes in policy and operations needed to accommodate these important adjuncts are of vital concern to both professional and administrative personnel, as well as to over-all management.

Altogether, management may be considered a cyclical activity—a never-

ending process that guides and coordinates the functions of many people of varied attainments in the achievement of difficult and important goals. The professional person is vital to the functioning of this management process. Without question he is a part of management.

Summary

The professional staff of a rehabilitation center has a primary role in the center's management. The adequate performance of this role, whoever plays it, helps to lay the foundation for superior rehabilitation services and the conduct of these services on a high professional plane. With such a management concept, there is good reason to anticipate the attainment of maximum service to the disabled within the capacity of the available staff and facilities. Moreover, this high level of efficiency may be achieved at a fair and reasonable cost. The management pattern that will produce these results is, in many places, rehabilitation's hidden dimension. The men and women of rehabilitation owe it to themselves, as well as to their patients and the community, to have a better understanding of management's capacity for producing a climate conducive to superior accomplishment. Only when this understanding is attained can it truthfully be said that management is no longer a hidden dimension, and that the pattern for reaching maximum performance levels has been achieved.

Discussion

Nila Kirkpatrick Covalt, M.D. (Winter Park, Fla.): This is a timely and important paper on an important subject. While many rehabilitation centers have been in the hoped-for or even planning stage, the money allocated by the federal government will now assure the actual development of a specific number of new, or expanded center facilities.

The Conference on Rehabilitation Centers, a national organization founded in 1952, has spent considerable time in trying to define a rehabilitation center and in trying to spell out what services must be provided as an integral part

of the program. The Committee on Rehabilitation Centers of the American Congress of Physical Medicine and Rehabilitation has also dealt with the definition, as has the Office of Vocational Rehabilitation when drafting what eventually became Public Laws 565 and 482 of the 82nd Congress.

Not only types of services, but direction of the services have been a matter of discussion in these groups. Whether there shall even be medical direction and how many hours even one physician should spend within a center has called for much debate. It is unfortunately true that many so-called rehabilitation centers offering therapy to handicapped persons have been functioning for a variable number of years but provide no medical direction within the facility itself. Rather, they depend entirely upon the prescriptions written and mailed to the center by any local physician who desires therapy, usually physical, for his patient.

Mr. Gorthy's paper appears to offer primary guideposts, regarding organization, to new centers now under development. If its precepts are followed, in existing centers, it most certainly can suggest methods for providing a greater service to patients in that community by making more efficient utilization of finances and staff time, as well as of the facility.

Mr. Gorthy has pointed out that it is not important who the manager, or the over-all coordinator, is, if he has the qualifications and understanding of management. While, in many instances, this person may be a physician, unless that physician prefers to be only an administrator, then his time should not be wasted on administration to the detriment of time available for clinical care of patients.

Some physicians would be hesitant to accept such a program as is outlined for the reason that they may have been on hospital staffs where the administrator, along with the board of directors, determined all hospital policies, including the dictation of methods of medical care of the patient, with the medical staff having no voice in those decisions. Such a lack of co-operation would not occur if management were carried out as Mr. Gorthy has outlined.

The hidden dimensions, including the use of efficient management, I can well attest to from my own personal experience in Connecticut. When I went there in 1948 to establish a program of physical medicine and rehabilitation for the State Commission for the Chronically Ill, Aged, and Infirm, the first position I asked the medical director of the commission and, through him, the State Personnel Director to establish was exactly the type of position Mr. Gorthy has described. I even offered the names of two men well qualified for such a position. I was still trying to get the position set up when I left that program in 1953. The need for a physiatrist and therapists was understood from the start.

This meant that, as the department director, in all matters pertaining to the department, administrative as well as clinical, instead of team approach, I often had the feeling that I was running a 17-ring circus. There are always matters that require supervision and others related to policy making. Since rehabilitation needs definitely fluctuate, a doctor-director at times has to choose between what is more important at the moment, the administrative or the clinical problems. One gets bogged down in trivia, but trivia has to be taken care of, even though it takes time.

This means that the advancement of a program, let alone research, simply cannot be accomplished as soon as or as adequately as the director desires. The director then does the best he can in those circumstances. One reason that this can be true is a question of finance.

Mr. Gorthy did not mention this, nor is it a necessary part of his paper. In my opinion, this very important financial facet is another reason why I consider this paper to be so timely. I am sure all new centers must consider the position of manager as an important part of their initial and continued budget, and that existing centers must also begin to budget for this service.

In emphasizing this one individual position, in no way am I minimizing the over-all management and the establishment of policy by co-ordination and teamwork that is mentioned in this paper.

I would reemphasize that this management concept should increase efficiency of services. It seems to me that physiatrists should be the leaders to help advance this concept, since they are so well aware of the fact that rehabilitation cannot be completed, or maximum goals attained for any patient until there is this team approach. It should most certainly be stressed to these new centers, also, that there must be medical direction within their centers—the amount of time, and kind of medical care to be a matter of policy arrived at by physicians themselves.

It is my opinion that copies of Mr. Gorthy's paper should be made available to all members of the Conference on Rehabilitation Centers, and to those new centers that have received the federal grants, even as members of the American Congress of Physical Medicine and Rehabilitation have had the opportunity to hear this paper, whether they are all in agreement or not.

IMPORTANT ANNOUNCEMENT

American Board of Physical Medicine and Rehabilitation

The next examinations for the American Board of Physical Medicine and Rehabilitation will be held in New York City, June 8 and 9, 1957. The final date for filing applications is March 1, 1957. Applications for eligibility to the examinations should be mailed to the Secretary, Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

Use of the Invalid Lifter in the Care of the Severely Disabled Patient

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With the Technical Assistance of
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Functional training of the severely disabled patient is generally concerned with two problems. The first problem is to teach the patient how to assist in his daily care. This has been termed assistive activities and was described in an earlier paper.¹ The other problem is to teach the person responsible for the care of the severely disabled patient how to care for and handle the patient quickly and efficiently. One facet of this problem includes the use of mechanical aids that facilitate the task of managing the completely dependent patient. This paper will be limited to the discussion of one of these mechanical aids, namely the invalid lifter. The primary purpose of the discussion will be to summarize the use of an invalid lifter in care of a severely disabled patient at home.

An invalid lifter is a device designed to enable the attendant to lift and move the patient safely and with as little physical effort or strain as possible. Although there are several simple, workable and practical models on the market, they are all basically the same in construction and operation and vary from manufacturer to manufacturer only in design and workmanship. The lifter is a multipurpose device in that it is designed for use in transferring the patient to and from bed, wheelchair, toilet, bathtub, and car. It employs a hydraulic pump to raise and lower the patient. To lift the patient, the attendant merely pumps the handle of the hydraulic piston until the patient is raised to the desired height. A self-locking device safely holds the patient suspended. To lower the patient, the attendant opens the release valve and gently lowers the patient.

Most lifters in use today consist of a basic unit which includes a tripod or a base equipped with casters, a mast, a boom, a hydraulic pump, and some type of sling or harness arrangement. Even

though the basic unit can be used to lift the patient in and out of some bathtubs or to transport the patient to and from a car, most manufacturers feature an adapter unit especially designed to do these activities easily. The lifter is compact and easy to handle and constructed with due regard to easy assembly and dismantling for storage or transportation.

Criteria for a Suitable Lifter

Whenever a lifter has been recommended for a patient by a physician the question is asked "Which of the many lifters available today is the best to procure?" This can only be answered by setting forth the criteria for a suitable lifter.

The Lifter Should Be Safe to Use: The safety of the patient depends upon the hydraulic operation, the type of sling or harness employed, and the stability of the entire unit. Since most lifters are hydraulically operated, the hydraulic pump should be able to lift and hold a weight far in excess of the task it will be expected to perform. The hydraulic operation should be smooth and free of jolts and sudden movements.

Several types of slings or harnesses available meet every condition of use. If possible it is best to actually lift or move the patient with different types of slings and harnesses to determine which type is the easiest to place on the patient, which holds him safely and comfortably, and whether or not some modification is required. If a special sling or harness is necessary, then it must be determined whether or not the lifter to be procured can accommodate the special arrangement.

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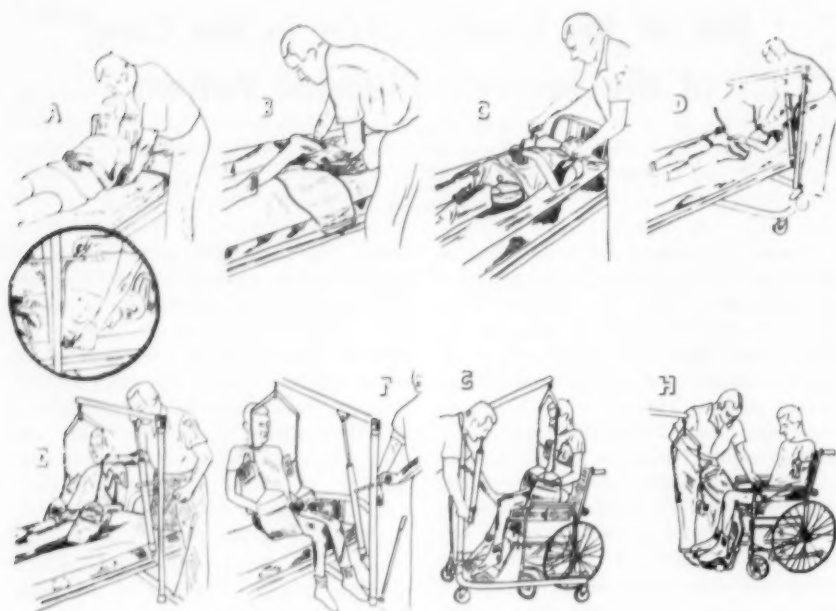


Fig. 1 — Moving patient from bed to wheelchair.

The stability of the entire unit depends upon the type of base employed. The base should be so constructed that the structure will not tip over regardless of what changes of position are executed or what weight load the lifter is lifting or carrying. If the base is an adjustable type, the inclusion of this feature should not sacrifice stability. The base should withstand a stability test both at the narrowest and widest point of adjustment.

The Lifter Should Be Easy to Use: Ease of operation is concerned with placing the patient in the sling or harness arrangement, operation of the hydraulic unit, and manipulation of the lifter with the patient suspended.

The sling or harness arrangement should be of such design that it is a simple task to adjust and attach the seat carriage. Slings or harnesses employed should be readily adaptable for toilet activities. It is important that the sling or harness be constructed of a durable, washable material that can be easily removed for cleaning.

Simplicity in the operation of the hydraulic pump and release valve is essential, so that, if necessary, even a

child can operate the unit with complete safety and comfort to the patient.

In order to permit the transportation of a patient from one room to another without the necessity of transferring to wheelchair, the lifter should be easy to manage and to steer while the patient is suspended. The inclusion of some type of steering handle is a worthwhile feature. At any rate the caster arrangement should be flawless so as to facilitate close maneuvering.

The Lifter Should Be Portable and Easy to Store: The diligent use of a lifter can take the severely disabled patient out of a "one-room" existence. If the lifter is to open new avenues for fuller living by making it possible for the patient to travel or visit, then the lifter must be easy to assemble and take apart. It should be light; its heaviest section should weigh no more than 15 lb., a convenient weight to handle. The lifter should fit the trunk or rear seat section of a car for easy storage. A lifter that requires no installation of any kind for use with a car is the more versatile unit, in that the patient will not be dependent upon any one specially equipped car.

Storage in the home is another problem that has to be considered. A logical place of storage would be under the bed where it will always be readily accessible. Its tallest section should easily fit under the lowest type of bed without any parts protruding for someone to trip over.

Maneuvering the Lifter

Although it is a relatively simple task to set up the patient and to operate the lifter, the importance of teaching the individuals who will be responsible for the care and handling of the patient after discharge from hospital or rehabilitation center cannot be too strongly emphasized. They should be afforded the opportunity to observe a therapist setting up the lifter, placing the slings or harness straps on the patient, and maneuvering the lifter and patient through various daily activities. At the New York State Rehabilitation Hospital those who must look after the severely disabled patient are taught how to assist and handle the patient. If a lifter has been recommended, the instructions include assembly, operation, and maintenance of the lifter. After definite sling or harness positions have been determined and after successful methods and skills have been worked out by the therapist, the family is taught, under the supervision of a therapist, how to handle the patient and maneuver the lifter.

Moving Patient from Bed to Wheelchair: With the patient lying supine in bed, adjust the canvas back and seat slings on the patient in their proper point of adjustment position (fig. 1A-C). Move the lifter close to the bed and attach the S-hooks to the back and seat slings (fig. 1D). Check the release knob to see that the hydraulic valve is closed (fig. 1 insert). Using a pumping motion on the hydraulic pump handle, raise the patient clear of the bed (fig. 1E). Swing the patient's feet off the bed, grasp the guide handles of the lifter, and move the patient away from the bed (fig. 1F). With the patient suspended directly over the wheelchair seat open the release knob slowly, lowering the patient into the wheelchair (fig. 1G). The speed of lowering the body is controlled by the

release valve. The weight of the body will lower the overhead boom until the patient is seated in the wheelchair. To slacken the suspension chains, press down on the overhead boom, disconnect the S-hooks, and remove the canvas back and seat supports (fig. 1H).

Even slight experience with the canvas back, seat slings, chains, and S-hooks will establish the fact that for each patient with a given lifter and for each daily activity there is one arrangement and one only at which the patient can be safely and comfortably lifted without having to pause at frequent intervals during the lift and transfer to make sling readjustments and change the chain-lock arrangement. This is *point of adjustment*. If slings are not properly located on the thighs and back, the patient can slip through the back and seat supports; if the chain-lock adjustment is too high, the patient can accidentally tip backward, or if the chain-lock adjustment is too low, the patient can tip forward. The establishment of the point of adjustment is essential in lifting a patient with an invalid lifter. Once the point of adjustment has been worked out by trial and error it should be marked and remembered in some way. The exact location of the back and seat slings for each activity can be quickly and accurately relocated by the use of "anatomical landmarks." The chain-link arrangement can be relocated by marking the links with pieces of colored self-stick tape, finger nail polish or brightly colored string using a different color to identify the point of adjustment for each transfer activities, as, red for bed to wheelchair, green for wheelchair to car, etc.

Moving Patient from Wheelchair to Bed: With the patient sitting in the wheelchair, adjust the canvas back and seat slings in their proper point of adjustment position (fig. 1H). Move the lifter into position and attach the S-hooks to the back and seat slings. Check the release knob to see that the hydraulic valve is closed. Then, using a pumping motion on the hydraulic pump handle, raise the patient clear of the wheelchair seat (fig. 1G). Grasp the guide handles of the lifter and move the patient to the bed. The approach to the bed should

be straight forward so that the lifter base will glide under the bed; the patient will be sitting directly over the bed (fig. 1F). Turn the patient, placing his feet in the bed. Open the release valve slowly, lowering the patient to the bed (fig. 1E). The weight of the body will lower the overhead boom until the body is completely supine. To slacken the suspension chains press down on the overhead boom, disconnect the S-hooks, and remove the canvas back and seat slings (fig. 1D).

Moving Patient from Wheelchair to Toilet: Adjust the canvas back and seat slings in their proper point of adjustment and lift the patient from the wheelchair in the manner previously described for

moving patient from wheelchair to bed.

Using the guide handles of the lifter move the patient to the toilet. Before moving the lifter into proper position so that its base straddles the toilet, adjust patient's clothing for toilet needs (fig. 2A). Once this has been accomplished, the lifter should be pushed into proper position with the base straddling the toilet and the patient suspended directly over the toilet bowl (fig. 2B). Open the release valve slowly and carefully, gently lowering the patient to the toilet seat. Do not remove the seat and back slings or disconnect the S-hooks unless it is absolutely necessary for comfort or free bowel or bladder movement. If the pa-

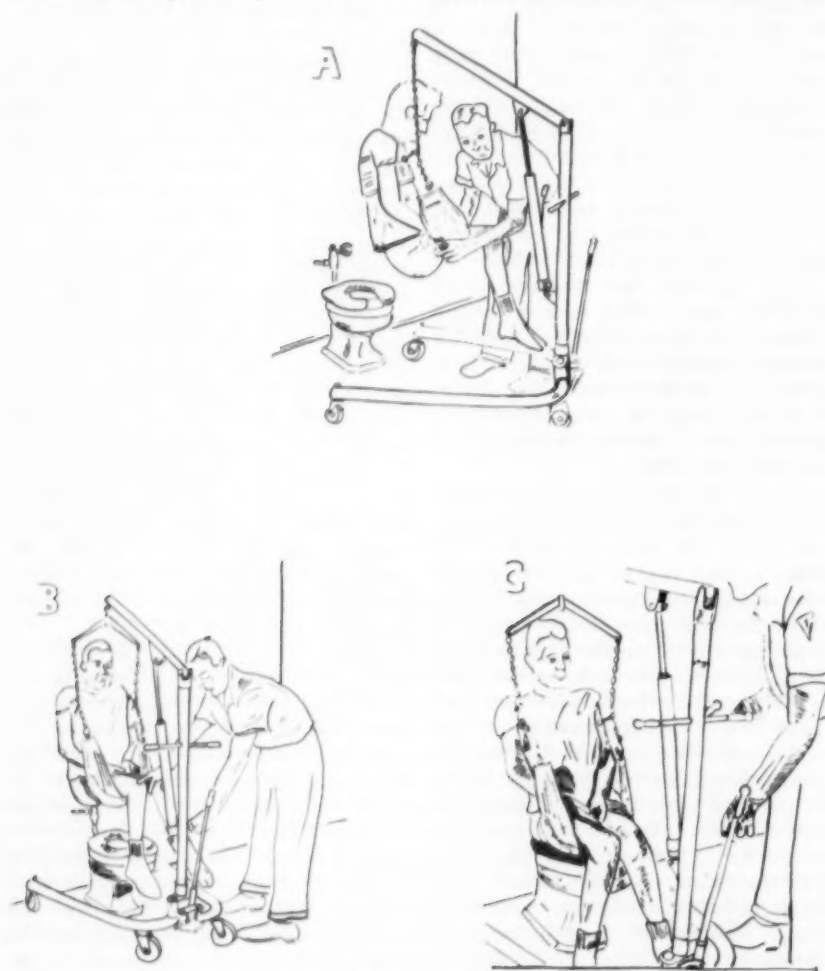


Fig. 2 — Moving patient from wheelchair to toilet.



Fig. 3 — Moving patient from wheelchair to car.

tient's sitting balance is poor, balance can be aided by keeping the patient in the proper point of adjustment with the suspension chain just taut enough to hold the patient in a comfortable sitting position.

It has been our experience that a seat sling narrower than the one provided as standard equipment with most lifters facilitates the lowering of the patient's clothing in making toilet (7-7½ inch width as contrasted to the 13-14 inch seat sling provided with a lifter). If it is inconvenient to acquire a special sling of narrower proportions, the sides of a standard seat sling can be simply folded over so as to reduce its width.

Moving Patient from Toilet to Wheelchair: The procedure for moving the patient from toilet to wheelchair is the reverse of the procedure used in moving the patient to the toilet. If the point of adjustment of the back and seat slings has not been disturbed, simply pump the pump handle and raise the patient clear of the toilet seat (fig. 2B). Cleanse the patient and readjust the clothing (fig. 2A). Move the lifter away from the toilet and place patient in wheelchair as previously described for moving patient from bed to wheelchair.

Moving Patient from Wheelchair to Car: With the patient sitting in the wheelchair, adjust the canvas back and seat slings in their proper point of adjustment position and lift the patient from the wheelchair in the manner previously described for moving the patient from wheelchair to bed. The point of adjustment of the chains and S-hooks has to be shortened considerably so that

the overhead boom will be centered in the middle of the patient's face (fig. 3A). This is necessary in order to get the boom into the cab of the car to facilitate raising the patient above the car seat for successful transfer.

Open the front door of the car as far as it will go. Using the guide handles move the patient to the car. The approach to the car should be straight forward with the patient's back to the open cab (fig. 3A). The base and wheels glide under the car until the frame of the car prevents the patient from being moved closer. It is best to have the lifter on the same level as the car (street level). If the activity is performed with the lifter on the curb level, it is almost impossible to get the base close enough to the car to get the patient into the car.

Tip the patient slightly backward, and carefully place the patient's head just inside the cab of the car (fig. 3B). Continue to move the lifter further forward, getting the patient into the car as far as the boom will permit. Raise the patient slightly by pumping the hydraulic pump until the patient is clear of the car seat. How far into the car the patient can be brought and how high off the seat the patient can be raised are dependent upon the make and model of the car and also the height of the individual. It is important to get the patient clear of the car seat so that the legs can be easily brought into the car and the patient can be readied before being lowered into the proper sitting position.

Grasp the patient under the thighs and place the legs into the cab (fig. 3C). Readjust the patient's position so that he

will be in good posture when lowered to the sitting position. Slowly open the release valve and lower the patient to the car seat. Press down on the overhead boom to slacken the suspension chains and disconnect the S-hooks, leaving the back and seat slings in place. For the sake of riding comfort, the back sling may be removed, but if possible the seat sling should be left in place for easy management when moving the patient from car to wheelchair.

Most lifters can be dismantled and stored in the car trunk and reassembled at the end of the journey.

Moving Patient from Car to Wheelchair: The procedure for moving the patient from car to wheelchair is the reverse of the procedure described in moving the patient to the car.

Adjust the canvas back and seat slings in their proper point of adjustment. Move the lifter into position and attach the S-hooks to the back and seat slings. Check the release knob to see that the hydraulic valve is closed.

Raise the patient to the point where he is just slightly free of the car seat. Grasp the patient under the thighs and place the legs outside of the car (fig. 3C).

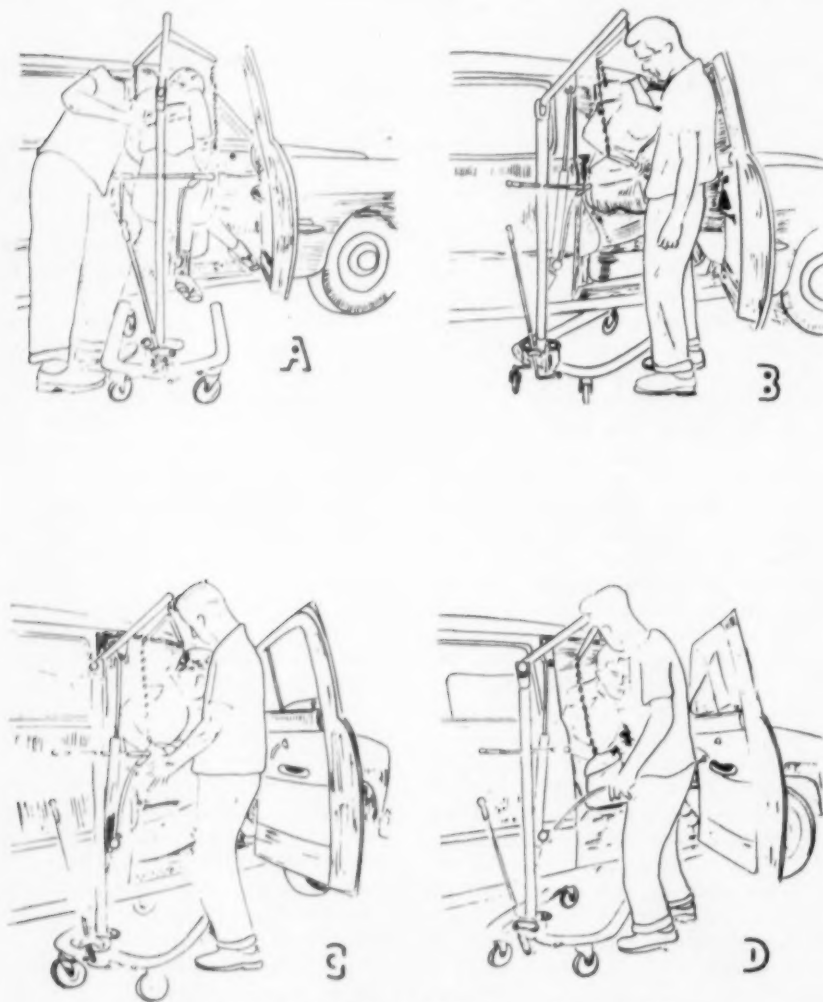


Fig. 4 — Moving patient from wheelchair to car — alternate method.



Fig. 5 — Moving patient from car to wheelchair — alternate method.

Move the lifter away from the car as far as possible until the frame of the car prevents the patient from being moved any further. Tip the patient slightly backward and bring his head outside the car (fig. 3B).

Move the lifter completely away from the car (fig. 3A) and place the patient into wheelchair as previously described for moving patient from bed to wheelchair.

Moving Patient from Wheelchair to Car (Alternate Method): Open the front door of the car as far as it will go. Using the guide handles move the patient to the car. In this method the approach to the car should be at a slight angle with the patient facing the open cab. The base and wheels glide under the car until the frame of the car prevents the patient from being moved closer. Here as with the previously described method it is best to have the lifter on the same level as the car (street level).

Place the patient's feet into the open cab (fig. 4A). Continue to move the lifter further forward, advancing the patient into the car as far as the boom will permit or until the frame of the car prevents the patient from being moved any closer (fig. 4B).

Lower the boom until the patient's head just clears the frame of the car (fig. 4C). Push hips into the car (fig. 4C) tipping the patient slightly forward and

bring the head just inside of the car. Do not lower the patient into the seat of the car. It is important to keep the patient suspended in order to facilitate the next step of bringing the hips into the car. If it is impossible to lower the boom to the point where the head clears the car frame without the buttocks coming into contact with the seat, readjust and relocate the position of the lifter until the desirable position is attained.

Slowly open the release valve and lower the patient gently down into the car seat (fig. 4D). Press down on the overhead boom to slacken the suspension chains and disconnect the S-hooks leaving the back and seat slings in place.

Moving Patient from Car to Wheelchair (Alternate Method): As previously described, adjust the back and seat slings and attach to S-hooks. Pivot the patient and place the legs outside of the car (fig. 5A).

Check the release knob to see that the hydraulic valve is closed. Then, using a pumping motion on the hydraulic pump handle, raise the patient off the car seat (fig. 5B). Move the lifter completely away from the car and place the patient into the wheelchair as previously described for moving patient from bed to wheelchair.

Summary

The use of the invalid lifter as a valuable adjunct to the care of the

severely disabled patient who must be cared for in the home without the help of professional attendants or aides has been described. The criteria for a suitable lifter have been explained. The use of the lifter in transferring the patient to and from wheelchair, bed, toilet, and car was described along with an analysis

of the methods that can be considered basic in the use of any lifter.

Reference

1. Hoberman, M., and Cicens, E. F.: Assistive Activities for the Custodial Type Patient. *Arch. Phys. Med. & Rehab.* **34**:418 (July) 1953.

Clinical Note: Applicator for Mineral Oil in Ultrasonic Therapy

Ivan C. Smith, M.D.
Youngstown, Ohio



Until recently I had experienced considerable inconvenience in applying mineral oil as a coupling agent in ultrasonic therapy. Formerly, the oil was kept in an open container and applied by dipping the fingers into the oil and rubbing it on the patient's skin.

The chief difficulties were spilling the oil when the equipment was moved, dripping the oil between the container and the patient, and application of an improper amount of oil. All of these inconveniences have been overcome since the oil has been kept in a plastic container such as the one shown in the accompanying illustration.

These containers, of about 8 oz. capacity, are obtainable at most notions

counters. Although many of them are decorated and labeled with such captions as "salad oil" or "mustard," they are also available in a plain white finish.

If desired, a metal or plastic fastener can be attached to the ultrasonic generator to hold the container; however, this is hardly necessary, for even though the bottle is tipped over only one or two drops of oil are spilled.

I have seen the mineral oil kept in stoppered bottles in some clinics. This is not convenient as it necessitates the removal and replacement of the stopper with each application. The plastic containers offer all of the advantages of the stoppered bottle, with none of the inconveniences.

COMMITTEE REPORTS

The following reports were presented at the annual business meeting of the American Congress of Physical Medicine and Rehabilitation, September 9-14, 1956, The Ambassador, Atlantic City, N. J.

Advances in Education

We have followed the pattern of activity established for this Committee in the past few years and have attempted to promote the educational efforts of this Congress through the media of instructional seminars and conferences related to the training of physiatrists.

In recent years the activities of the Congress have increased tremendously. As one result of this increase there have been unavoidable competitions for time, and the instruction seminars have been less and less well attended. Were the seminars to be abandoned, we lose not only a valuable tool for self-education, but also an equally valuable medium for intellectual exchange with others outside our group. Your Committee feels that the instruction seminars should not be lost, but if they are to survive it must be through the active support of the membership of the Congress.

This year the Committee has sought to increase the influence of physical medicine and rehabilitation by a conference with the deans of schools of medicine in this general area. In this meeting an attempt has been made to explore with these educators ways and means by which medical students can be better indoctrinated with the principles and practices of physical medicine and rehabilitation. A summary of this conference will be sent each physiatrist engaged in this type of teaching effort. It is the hope of this Committee that this program will be continued. The annual meetings of the Congress are held consecutively in rather widely dispersed geographical areas, and for this reason we will have an unexcelled opportunity to discuss these problems of education with a different group of deans of schools of medicine at each meeting.

Pending next year's meeting, your Committee urgently desires to know your own wishes in matters of education.

Respectfully submitted,
Donald L. Rose, *Chairman*
Robert C. Darling
Harold Dinken
Thomas F. Hines
Paul A. Nelson
James W. Rae, Jr.

Balneology and Health Resorts

The Committee on Balneology and Health Resorts met at the Statler Hotel, Detroit on August 31, 1955, at its regular luncheon meeting. Prior to that we had a meeting of the officers of the Committee with some of the representatives of the newly formed American Spa Association, in which plans for combined

cooperation of our Committee and the officers of the Association were discussed.

At the luncheon, 42 persons were in attendance. Among them were all the officers of the American Spa Association and American Congress of Physical Medicine and Rehabilitation. Mr. Libby, Superintendent of Hot Springs National Park, Ark., was also present.

This Committee was informed by the American Spa Association that its members will carry on in the tradition we have always maintained. The members of the newly formed Association will adhere to the principles of practicing in an ethical and scientific manner. They intend to limit their membership to those spas which will have medical supervision of some sort, and they will endeavor to cooperate with this Committee in every conceivable manner.

The Association held its second annual meeting in Safety Harbor, Fla., and one of our Committee members, Dr. McClellan, represented us as unofficial observer. In his report to the Chairman, he confirmed the carrying out of the promise made by the Association officers to us at our Detroit meeting.

The American Spa Association is slowly organizing itself into a virile society and this Committee has indicated its willingness to give such assistance as it is able to in order to further ethical spa practice.

Respectfully submitted,
Hans J. Behrend, *Chairman*
William Bierman
Ferdinand Lustig
Walter S. McClellan
Ferdinand F. Schwartz
Samuel A. Warshaw

Awards for Scientific Exhibits

The selections of this committee were published in the October, 1956 issue of the *Archives of Physical Medicine and Rehabilitation*.

Respectfully submitted,
Clarence W. Dail, *Chairman*
Thomas P. Anderson
Otto Eisert
William H. Georgi
Harry W. Mims

Braces, Splints, and Prostheses

Following the appointment of this Committee in the fall of 1955, the Chairman sent to the Committee members (and the President of the Congress) a number of objectives for their recommendation and further suggestions. After considerable correspondence these ob-

jectives were approved by the Committee. We should like to report what the objectives were, and what action has been taken thus far to accomplish the desired ends.

A. Recommendation: that the Committee be reconstituted on a more permanent basis, i.e.; that members be appointed for a three- to five-year period. Action: approved by the President and referred to the Congress for appropriate action.

B. Recommendation: that members of the Congress be circularized for new devices and ideas, to be submitted to the regional member of the Committee. Action: this was accomplished by the Congress office. It should be noted that the response from the membership was very poor both qualitatively and quantitatively.

C. Recommendation: that space be made available in the *Archives of Physical Medicine and Rehabilitation* for publication of such material which the Committee believes is of significant value. Action: the President has notified the Committee that the Editorial Board has agreed to make space available.

D. Recommendation: that space be made available at the annual Congress meeting for an exhibit of material or subject matter selected by the Committee for presentation to the membership. Action: the President has advised that the Committee Chairman need only apply to the Congress for space in the Scientific Exhibit.

E. Recommendation: that Committee members contact private or endowed brace agencies to determine if they would fabricate new types of devices passed by the Committee for members at actual cost price. Action: the brace shop of the Institute for Crippled and Disabled, New York City, and the Gonzales Warm Springs Foundation, Gonzales, Texas have advised that they would be glad to perform this service for the Committee.

F. Recommendation: that the Committee be authorized to establish contact with other groups interested in the same general area. Action: several Committee members have contacted similarly interested groups. It is suggested that the President write to one of these groups (American Board for Certification of the Prosthetic and Orthopedic Appliance Industry), recommending a Physiatrist to serve on their Board of Advisors.

At their annual meeting, the Committee discussed recommendation D, exhibit at the annual Congress meeting. It was the unanimous opinion of the Committee, that a "live exhibit" on "Bracing for the Lower Extremity" be presented next year at Los Angeles.

The Committee also discussed a problem arising from recommendation C, namely the cost of reproducing photographs and/or illustrations of material recommended by the Committee for publication in the *Archives of Physical Medicine and Rehabilitation*. It was the feeling of the Committee that such costs should be absorbed by the Congress. How-

ever; until this is resolved, the member submitting the material will be asked to underwrite this cost.

Respectfully submitted,
Morton Hoberman, *Chairman*
Robert L. Bennett
Louis P. Britt
Edward E. Gordon
David Rubin
Odon F. von Werssowetz

Central Office

Pension and Insurance Plans

The Committee has no formal report to make.

Respectfully submitted,
Ralph E. DeForest, *Chairman*
Frank H. Krusen
Walter J. Zeiter

Chronically Ill and Aged

No formal meetings were held but in an attempt to present a panel for the 1956 Congress meeting, questionnaires were sent to members of this Committee. Various suggestions were made in response to this questionnaire. It was felt that the members of the proposed panel ("The Chronically Ill and Aging—Whose Responsibility?") should not be physiatrists, but rather individuals who had some association with the field. For that reason, the following panelists were chosen: Dr. Alfred Kraft, Assistant Director, Allegheny County Institution District, Pittsburgh, Pa.; Dr. S. David Pomrinse, United States Public Health Service, Washington, D. C.; Dr. Leo Price, Director, Union Health Center, New York City, and Mr. Henry Viscardi, Executive Director, Abilities, Inc., New York City. Mr. Viscardi notified the Committee that he would be unable to serve on the panel because of a conflicting commitment. The following substitution was therefore made: Mr. K. Franklin Conaway, Managing Director, Goodwill Industries of Pittsburgh, Pittsburgh, Pa. Dr. Ferderber of Pittsburgh served as moderator of the panel discussion.

It is hoped that the Chairman appointed for 1957 will continue to carry on the activities on behalf of the chronically ill and aging who so greatly require the services of our specialty.

Respectfully submitted,
Murray B. Ferderber, *Chairman*
Michael M. Dacso
Gustave Gingras
Edith L. Kristeller
Edward W. Lowman
Joseph N. Schaeffer

Constitution and By-Laws

The Committee submits the following recommendations:

That ARTICLE III, Section 2 (a) (1) of

the Constitution (Qualifications for Membership) be amended by striking the following words and letters:

"... and, unless a foreign resident, be either (a) a member in good standing in a local medical society which is a component society of the American Medical Association (b) be..."

That ARTICLE III, Section 1 of the Constitution (Classes of Membership) be amended by adding a new subdivision (d) to read as follows:

(d) Affiliate members.

That ARTICLE III, Section 2 of the Constitution (Qualifications for Membership) be amended by adding a new paragraph (d) at the end thereof to read as follows:

(d) To be an Affiliate Member, a person actively enrolled in an approved residency or fellowship in Physical Medicine and Rehabilitation.

NOTE: The Constitution requires that all constitutional amendments be presented in writing at the annual business meeting and then lie over until the following annual business meeting. Between the two meetings a copy of the proposed amendments together with a notice that the amendments will be voted on must be sent by mail to each member or published in the Archives of Physical Medicine and Rehabilitation not less than one month in advance of the annual business meeting at which action is to be taken.

That CHAPTER 1, Section 3 (a) of the By-Laws (Dues) be amended by adding a new sentence at the end thereof, to read as follows:

Affiliate members shall pay one-half the annual dues required of active members.

NOTE: This amendment should lie over for one year awaiting action on proposed amendment to Constitution creating affiliate membership.

That CHAPTER II, Section 1, of the By-Laws (Discipline) be amended by striking the whole thereof, and inserting in lieu thereof the following:

CHAPTER II — Discipline

Section 1. Causes. — A member may be admonished, suspended or expelled if the member has committed one or more of the following acts or if one or more of the following acts has occurred:

- (a) Default in the payment of dues or special assessments.
- (b) Suspension or revocation of license to practice medicine or the profession in which the member holds a license.
- (c) Violation of the Principles of Medical Ethics or the Code of Ethics of the profession to which the member belongs.
- (d) Commission of a crime involving moral turpitude.

That CHAPTER I, Section 4, of the By-Laws (Requirement of Membership in County

Medical Society) be amended by striking all of Subdivision (b) and relettering Subdivision (c) Subdivision (b).

That CHAPTER V, Section 1, Subdivision (h) of the By-Laws (Standing Committees) be amended by striking the same and inserting the following in lieu thereof:

(h) Chronically Ill and Aged.

That Subdivision (u) of the same Chapter and Section be amended by striking the same and inserting in lieu thereof the following:

(u) Essay Award.

That CHAPTER V, Section 2, of the By-Laws (Committee on Advances in Education) be amended by striking the words "each year" at the end of the first sentence, and by adding a new sentence at the end of the first sentence, to read as follows: The members shall be appointed so that the term of one member shall expire each year.

That CHAPTER V, Section 16, of the By-Laws (Appointment of Nominating Committee) be amended by striking the word "President" in the first sentence and inserting in lieu thereof the words "Board of Governors."

Respectfully submitted,

Miland E. Knapp, *Chairman*

Earl C. Elkins

Joseph L. Koczur

Sedgwick Mead

F. Manley Brist, *Ex-officio*

Cooperation with Air Force, Army, Navy, Public Health and Veterans Administration

On January 16, 1956, the chairman wrote each committee member a letter requesting suggestions for the most effective functioning of this committee. Replies, including constructive suggestions, were received from all members of the Committee. On June 12, 1956, a questionnaire type form was sent to the Surgeons General of the cognizance services and replies have been received from the departments of the Army, Department of the Navy and the Veterans Administration.

Perusal of the completed questionnaires reveals that the Veterans Administration is making broad and rapid strides in the field of Physical Medicine and Rehabilitation. Of the two military reports received, physical medicine services in the U. S. Army are superior to those in the U. S. Navy.

The committee respectfully submits the following recommendations:

1. That continued support and impetus be given to the various governmental services for the further development of physical medicine and rehabilitation in federal hospitals;

2. That active assistance in the recruitment of resident physician, physical therapists, and certified physiatrists be given these agencies so that each hospital may have a fully-staffed department;

3. That hospital services utilizing in-patient beds be provided where personnel and facilities are adequate;

4. That the activities of this Committee be continued and if possible in a more forceful manner;

5. That the Congress and its officers officially endorse those recommendations which will allow Physical Medicine and Rehabilitation to gain greater prestige in the Federal Services, and

6. That this Committee be discontinued unless more official support is received from the Congress.

Respectfully submitted,

Anton A. Tratar, *Chairman*

Anthony L. Brittis

A.B.C. Knudson

Harold B. Luscombe

Ray Piaskoski

Cooperation with Food and Drug Administration

The Committee has no formal report to make.

Respectfully submitted,

Ralph E. DeForest, *Chairman*

Leonard F. Bender

Harry Kessler

Isadore Levin

Edward B. Shires

Correlation of Physical Medicine and Psychiatry

It was gratifying to see the entire symposium on "Contribution of Psychiatry to Physical Medicine and Rehabilitation," presented at the last annual session in Detroit, printed in a recent issue of the *Archives of Physical Medicine and Rehabilitation*. It is also regrettable, however, that no mention was made in the publication that this symposium was organized and accomplished through the efforts of our committee.

On May 28th and 29th of this year, at the request of the President of the Congress, a member of this committee represented the Congress at the Fourth National Rehabilitation Association Conference which met in this city. The title of the Conference was "Rehabilitation and Mental Health." Forty-one various medical and quasi-medical organizations were represented. Although several of the main speakers were members of the American Psychiatric Association, an official representative from that organization was conspicuous by his absence. After several introductory presentations including "An Overview of Existing Programs for the Rehabilitation of the Mentally Ill and Retarded" by Jay Hoffman of St. Elizabeth's Hospital and an address by Jack Ewalt on the work of the Joint Commission on Mental Illness and Health, we were divided into two groups. Group A discussed "Problems of Rehabilitating the Mentally Ill" and Group B had for its topic "The Importance of Emotional Factors in the Rehabilitation of the Handi-

capped." The conference summary was given by Doctor Morton Seidenfeld, Director of Psychological Service and Public Education of the National Foundation for Infantile Paralysis. Perhaps the best way to summarize the result of the conference would be to state that there was general disappointment at lack of concrete decisions or contributions. In spite of this general feeling, I personally believe that this conference served an important purpose and would like to commend Mr. E. B. Whitten, the Executive Director, and his colleagues of the National Rehabilitation Association for organizing such a meeting to enhance the cause of rehabilitation. Incidentally, one of the reasons the discussion never left ground was because of an unsuccessful attempt even to come to an acceptable definition of "rehabilitation."

There are a few impressions of special interest that we would like to report to you.

1. The mere fact that there are so many various agencies concerned with the problem of rehabilitation, functioning apparently without a centralized integrating directive force.

2. Each organization seems to be so concerned with its own sphere of operation that it develops a scotoma in reference to the function and problems of the other organizations working presumably toward a similar objective.

3. During some informal but very informative candid individual discussions, the role of the physician, which I believe we believe to be the leader of the rehabilitation team, is subject to controversy and challenge. This should prove to be an interesting topic for a panel discussion.

Among some of the other activities of the committee was an opportunity to observe the relationship between psychiatry and physical medicine in two Army hospitals. There is no semblance of any such integration as we see in the Veterans Administration Hospitals. In fact, the status of Physical Medicine Services in the Armed Forces is quite lamentable as so well presented in the report of that committee. As a result of the tranquilizing drugs reducing the demand for "major" hydrotherapeutic measures for psychiatric conditions, this aspect of physical medicine in the Veterans Administration has been delegated to the Nursing Service. Nevertheless, members of the Physical Medicine Service still continue the training and act on a consultant basis. We are referring to the cold wet sheet packs and continuous flow baths. To a certain degree, this move is regrettable because it is felt that the general quality and the proper approach to the patient will suffer, however the move was indicated for practical reasons.

Although rehabilitation bed services are quite common in general hospitals, there are no similar wards in the psychiatric hospitals. A blueprint for such a bed service where very intensive preconvulsive and social rehabilitation measures will be applied is now a project of a member of this committee.

The most disappointing aspect of this committee's work is the apparent lack of interest of its function by the membership. This does not appear to be limited to our committee but seems to be true in respect to other committees as well. The general feeling is that our committees could be much more effective.

It is therefore recommended that the problem of enhancing the function of committee work and the interest in this work by the general membership be part of the agenda of the Board of Governors. It would be paradoxical to suggest that a committee be appointed to study this problem.

Respectfully submitted,
Jack Meislin, *Chairman*
Daniel Dancik
Everill W. Fowlks
Keith C. Keeler
Norman Mitchell

John S. Coulter Memorial Lecture Fund

The Committee has no formal report to make.

Respectfully submitted,
Ben L. Boynton, *Chairman*
H. Worley Kendell
Walter J. Zeiter

Ethics

This Committee was asked to arrange a panel discussion of some of the hospital-physician relationships. This panel was held the morning of September 13, 1956. Dr. W. Edward Chamberlain of Temple University, Philadelphia, presented the radiologist's view of proper institution-physician relationship; Dr. Ralph Weaver of Butler, Pa., presented the pathologist's view. Mr. F. Manley Brist reviewed the Iowa court decision. Dr. Glenn Gullickson, Jr., Chairman of the Committee on Legislation, discussed pertinent laws which might affect institution-physician relationships. Dr. Oscar Selke reviewed the present status of a majority of the board physiatrists. Dr. Herman Rudolph, Chairman of the Committee on Economics discussed his present arrangements and made certain recommendations. This formal presentation was followed by a question and answer period.

The Committee submits the following recommendations:

That the Chairman of the Committee on Ethics be given the authority to contact certain members of the other Congress Committees—such as the Committee on Legislation, Economics, etc.—which could contribute to the compilation of the report on the recommended "Ethical Standards" of the American Congress of Physical Medicine and Rehabilitation. Also, that he be free to contact any members at large whose assistance in this matter might be necessary.

That this group study the problem at hand and formulate, compile, and establish what is considered to be the best ethical standards for the Congress; to propose and advocate the best course of action for the members of this specialty.

That before any final action or approval of these proposed recommendations be accepted all members of the American Congress of Physical Medicine and Rehabilitation be notified of these proposals for their approval, rejection or comments by having these recommendations circulated by mail before the next annual meeting.

Respectfully submitted,
Edward M. Krusen, Jr., *Chairman*
Josephine J. Buchanan
William J. LaJoie
Paul A. Nelson
George C. Twombly, Jr.

Finance

The annual financial report of the American Congress of Physical Medicine and Rehabilitation was published in the August, 1956 issue of the *Archives of Physical Medicine and Rehabilitation*.

Respectfully submitted,
Louis B. Newman
Herbert W. Park
Charles S. Wise
Frank H. Krusen, *Ex-officio*

Foster, Encourage and Coordinate Research Projects

During the 1954-1955 year, the members of the American Congress of Physical Medicine and Rehabilitation received a questionnaire prepared by this committee. Its purpose was to determine which members might be able to cooperate in evaluating Physical Medicine and Rehabilitation equipment before such equipment was placed on the open market for sale, and which specific field of interest was preferred by them for such evaluation. So large was the response that it was deemed timely and appropriate to approach all advertisers in the *Archives of Physical Medicine and Rehabilitation* to enlist the cooperation of manufacturers in such a project. It was emphasized, in the original communication to these manufacturers, that this committee would serve only to bring manufacturer and researcher together, without further responsibility; that evaluation would be made on a strict scientific basis; that manufacturers would be notified of the results, which would be considered for publication in standard scientific journals; and that placement of equipment in an institution for study would not indicate product endorsement.

The response was gratifying. Of the 37 manufacturers contacted, 23 indicated a willingness to cooperate with the program in the manner which had been proposed. Of this

group of 23, several have already requested the names of physiatrists who might be of help. When the problem of cost of shipping equipment entered, only the names of those physiatrists who resided within a few hundred miles of the concern in question were submitted.

According to the original plan, all further arrangements are made directly between manufacturer and physiatrist. In order to evaluate the efficacy of this program, however, this committee would benefit considerably if it had some information concerning the continuing relationships between researcher and manufacturer. Accordingly, we would welcome any informal progress reports from physiatrists who have participated in the evaluation program. Such reports would, of course, be confidential.

In addition to this aspect of research, which is essentially a form of applied research, we must not lose sight of the far more important basic research. It is only when a discipline contains within itself significant amounts of strong fundamental research that it has reached strength and maturity. It is therefore recommended that ways and means be found for encouraging research in residency training programs and for stimulating basic research in relation to the practice of Physical Medicine and Rehabilitation. We realize the difficulties which such a suggestion entails, but feel that only by realization of the problem can a solution eventually be reached.

Respectfully submitted,
Jerome W. Gersten, *Chairman*
Robert W. Boyle
Robert C. Darling
O. Leonard Huddleston
Y. T. Oester

Gold Key Award

The selection of this committee was published in the October, 1956 issue of the *Archives of Physical Medicine and Rehabilitation*.

Respectfully submitted,
Donald L. Rose, *Chairman*
Donald A. Covalt
Donald J. Erickson
Arthur C. Jones
Frederic J. Kottke

Legislation

The 84th Congress of the United States adjourned on July 27, 1956. During the two sessions of this Congress over 250 bills were introduced which were considered by the Committee because their provisions were pertinent in some aspect to the field of Physical Medicine and Rehabilitation. Support or opposition was expressed in the name of the American Congress of Physical Medicine and Rehabilitation when hearings were held by the Congressional Committees on bills of major importance.

The resolution passed last year by the

American Congress of Physical Medicine and Rehabilitation expressing opposition to the establishment of a National Agency for Handicapped was sent to the President, seventy Congressmen and other interested persons. The text of this resolution was printed in the February, 1956 issue of the *Archives of Physical Medicine and Rehabilitation*. None of the bills to establish a National Agency for Handicapped were reported from the Committees to which they were referred, and thus no action was taken during this Congress. It is quite probable that this measure will be introduced again during the 85th Congress, and further opposition will have to be expressed.

Opposition was expressed towards the disability benefit provisions of the Social Security Amendments of 1956. In addition to numerous letters to various senators, the American Congress of Physical Medicine and Rehabilitation was represented at the hearings of the Senate Committee on Finance by Doctor Frank Krusen. The disability provisions were dropped from this bill when reported to the Senate by the Committee on Finance but were reinserted by an amendment from the floor of the Senate. The Senate passed this amendment by 47 to 45 votes. It was accepted by the House, and with approval of the bill by the President, disability benefits are now part of the Social Security System.

Legislation to permit the appointment of doctors of osteopathy in the Medical Corps of the Army and Navy was also opposed. However, this bill was passed by both houses of Congress, signed by the President and is now law.

Endorsement and support of a number of measures were expressed. Among them were the Health Research Facilities Act of 1956 which provides a three year \$90,000,000 construction and expansion program for research facilities, which passed and became Public Law 835; the National Health Survey Act which provides for a continuing survey of sickness and disability in the United States, which passed and became Public Law 652; and the Medical Educational Facilities Construction Act which would have provided a five-year program of grants for construction, expansion and maintenance of medical schools, but which was not reported out of Committee.

Support was also expressed for a restoration of the House reduction in the requested appropriation for the Office of Vocational Rehabilitation. The appropriation was increased by the Senate and as finally written and passed provides \$33,500,000 for grants to States and other agencies for vocational rehabilitation programs, \$2,000,000 for special projects and demonstration program, \$1,500,000 for extension and improvement by the states of their vocational rehabilitation services, and \$2,950,000 for training and traineeships.

Other bills of interest to Physical Medicine and Rehabilitation which were passed and

signed by the President were the establishment of a Commission on the Aging and Aged which was included in the Social Security Amendments Act; amendment of the Vocational Rehabilitation Act of 1954, so that the provision which provides grants for expansion of rehabilitation programs was extended until June 30, 1957; and the Health Amendments Act of 1956 which provides among other provisions an extension of the Medical Facilities Survey and Construction Act of 1954 for two more years or until June 30, 1959.

Each year three new members are appointed to the National Council on Vocational Rehabilitation. Last year the Board of Governors of the American Congress of Physical Medicine and Rehabilitation submitted the nominations of three qualified physiatrists to the Secretary of Health, Education and Welfare for appointment to this Council. The Secretary of the Department of Health, Education and Welfare did not see fit to appoint any of the recommended physiatrists to the Council and, unfortunately, there is still no physiatrist on the National Council on Vocational Rehabilitation.

In conclusion, the Committee wishes to recommend:

(1) that again the Board of Governors submit nominations of qualified physiatrists to the Secretary of Health, Education and Welfare for appointment to the National Council on Vocational Rehabilitation; (2) that in the event legislation is proposed during the 85th Congress to establish a Federal Agency for Handicapped, the resolution adopted by the American Congress of Physical Medicine and Rehabilitation in 1955 in opposition to this measure shall again be sent to the appropriate members of the Federal Government.

Respectfully submitted,
Glenn Gullickson, Jr., *Chairman*
Thomas P. Anderson
Frances Baker
Robert L. Bennett
A. Ray Dawson
Arthur C. Jones
George H. Koepke
Oscar O. Selke, Jr.
Samuel S. Sverdluk
Charles S. Wise
Dorothea C. Augustin, *Ex-officio*
F. Manley Brist, *Ex-officio*

Medical Auxiliary Services Related to Physical Medicine and Rehabilitation

No material was submitted to this committee for its review and consideration.

Respectfully submitted,
A. Ray Dawson, *Chairman*
Herman J. Bearzy
Donald A. Covalt
Donald J. Erickson
Bruce B. Grynbaum
Roy H. Nyquist

Medical Economics

The Committee presents its report with a recommendation that it be withheld from publication in the *Archives of Physical Medicine and Rehabilitation*. (*The recommendation was put to a vote and unanimously carried.*)

Respectfully submitted,
Herman L. Rudolph, *Chairman*
Ernest F. Adams
George D. Wilson

Meeting Place

A number of invitations were issued to the Congress relative to the meeting place for 1959. The city of Minneapolis was selected for the 1959 meeting. At present the meeting schedule is Hotel Statler, Los Angeles, September 8-13, 1957, and The Bellevue Stratford, Philadelphia, August 24-29, 1958. Announcement concerning headquarters hotel and meeting dates for 1959 will be made later.

Respectfully submitted,
Walter J. Zeiter, *Chairman*
Lewis A. Leavitt
Jacob L. Rudd
Leonard J. Yamshon

Membership

The Membership Committee had three requests referred to it this year. The first was that of the affiliate membership, or some consideration for a special type of membership for residents. This was referred to the Committee on Constitution and By-Laws.

The second is that of the associate member. As many of you know, associate members are invited to the organization by the Membership Committee, and as far as I can determine, no one has ever accepted.

The Committee reviewed the Constitution and By-Laws and discovered that the same fee is paid by associate members, and they do not have the privilege of voting. We referred this question, after discussion, to the Board of Governors, suggesting that perhaps this fee should be reduced so that the people eligible for associate membership might be more interested in joining. These are physiologists, physicists, biochemists, and so on, who have worked with us in those capacities.

Our Committee also suggested that along with this group, the M.D.'s who are working as research people and not practicing medicine as such might also be invited on this same basis, if they preferred to do that. They might be invited; in either case they might join. But some of these people are not coming into our group. This was a request of the Board of Governors.

Honorary membership was considered. It was the feeling of the Membership Committee to consider whether or not someone should be

invited as an honorary member. It was suggested by the Committee to the Board of Governors that the name of Dr. Henry Kessler be considered. I understand the Board of Governors agreed with us that his name should be proposed at this time to be an honorary member. It is recommended that this be done. (*This recommendation was put to a vote and unanimously carried.*)

The following individuals applicants were voted to membership:

California: Karl H. Haase, Los Angeles; Richard S. Munger, San Francisco; Robert L. Smith, Los Angeles.

District of Columbia: Francis L. Wenger, Washington.

Indiana: Dennis E. Singleton, Marion.

Kansas: Anita M. Isaac, Newton.

Kentucky: Joseph E. Cox, Outwood.

Louisiana: Harry L. Acker, New Orleans.

Maryland: Norman Borken, Perry Point; Douglas Carroll, Brooklandville.

Michigan: L. Burton Parker, Ann Arbor.

New Hampshire: Robert M. Krout, Hanover.

New Mexico: Ernest Grover, Albuquerque; Raymond Mundt, Ft. Bayard.

New York: Victor Cummings, Mt. Vernon; Edward F. Delagi, Bronx; Orlando M. Fontes, New York City; Milton Holtzman, Rockville Center; Kenneth S. Landauer, New York City; W. Kenneth Lane, Queens Village, Long Island; Kurt G. Leichtentritt, New York City; William D. Loeser, Eggertsville; Isidore I. Neistadt, Valley Stream; Paul A. Oppenheimer, Bath; Boris J. Paul, Latham; Andor A. Weiss, New York City; Frederick Ziman, New York City.

Ohio: Nadene Coyne, Cleveland; Justus F. Lehmann, Columbus.

Oklahoma: Donald R. Adams, Muskogee.

Pennsylvania: Emilie L. Maxwell, Haverford; Alfons J. Muller, Philadelphia; Henry F. Parry, Philadelphia; Lucien L. Trigiano, Johnstown.

South Carolina: George K. Arnold, Columbia.

Tennessee: Claude W. Garrett, Memphis; Torsten H. Lundstrom, Johnson City.

Texas: Joel L. Roth, Ft. Sam Houston.

Vermont: Robert P. Smith, South Burlington.

Virginia: Bernard J. Michela, Alexandria.

Wisconsin: Albert M. Cohen, Milwaukee.

Canada: Alexander C. Pinkerton, Vancouver; Dorothy M. Stillwell, Vancouver.

Chicago; Thomas P. McConaghy, Camden, N. J.; Harold Neifeld, Brooklyn, N. Y.; Samuel Peskind, Cleveland; Harold Storms, Langstaff near Toronto, Can.; Bert A. Treister, Cleveland.

Five resignations were received and thirteen members were dropped for nonpayment of dues. Two members were listed as "address unknown."

Respectfully submitted,

Florence I. Mahoney, *Chairman*
Harvey F. Davis
Otto Eisert
Shelby Gamble
Albin T. Jousse
David M. Paul
Raoul C. Psaki
Samuel Sherman
Vann S. Taylor

Nominating

After the last meeting of the Congress, your Nominating Committee became aware of a critical attitude on the part of some members of our organization towards the way in which the Constitution and By-Laws of the society provided for the appointment of the Nominating Committee. This matter was thoroughly discussed among the members of the Committee who recommended to the Committee on Constitution and By-Laws that appropriate changes be made in the By-Laws to provide a more acceptable method of appointing a Nominating Committee. This matter has been in their hands.

The following recommendations of the Nominating Committee for the election of new officers was arrived at first by a secret mail ballot. The names of the candidates receiving the greatest number of votes were then submitted to the Committee which held its final meeting at The Ambassador Hotel, September 11. The Committee's unanimous recommendations are as follows: For President, A. B. C. Knudson, Washington, D. C.; President-Elect, Donald L. Rose, Kansas City, Kansas; first Vice-President, Arthur C. Jones, Portland, Ore.; second Vice-President, Frederic J. Kottke, Minneapolis; third Vice-President, Donald A. Covalt, New York City; fourth Vice-President, Donald J. Erickson, Rochester, Minn.; fifth Vice-President, James W. Rae, Jr., Ann Arbor, Mich.

We nominate for Secretary, Frances Baker, San Mateo, Calif.; Treasurer, Frank H. Krusen, Rochester, Minn.; Executive Director, Walter J. Zeiter, Cleveland, and Executive Secretary, Mrs. Dorothea C. Augustin, Chicago.

Respectfully submitted,

George Morris Piersol, *Chairman*
Earl C. Elkins
H. Worley Kendall
Fred B. Moor
William H. Schmidt
Arthur L. Watkins

Deceased Members

George E. Crosley, Milton, Wis.; J. A. C. Ethier, Sherbrooke, Que., Can.; D. Leo Haggerty, Trenton, N. J.; Emil J. C. Hildenbrand, Washington, D. C.; Disraeli Kobak,

Prize Lecture

The selection of this committee was published in the October, 1956 issue of the *Archives of Physical Medicine and Rehabilitation*.

Respectfully submitted,
Frederic T. Jung, *Chairman*
Fritz Friedland
O. Leonard Huddleston
William D. Paul

Program Committee

The Program Committee this year initiated a new requirement that each essayist wishing to present a paper at the scientific session of the American Congress of Physical Medicine and Rehabilitation submit an abstract at the time he applied to the program committee to be placed on the program. Several purposes were served by requiring this abstract. From a concise abstract which summarized the material for presentation it was possible for the Program Committee to make a better selection of papers. The abstract made it possible to group the papers by topic more effectively than could be done by title alone. The abstracts were published in the program of the annual session to make it possible for Congress members to select the papers in which they had the greatest interest.

The papers presented at the scientific session of the Congress serve two purposes. They are educational to the members attending the Congress and they are submitted to the editors of the *Archives of Physical Medicine and Rehabilitation* for publication. One of the requirements of the Congress is that all papers presented at the annual session must be submitted to the *Archives* for publication. In spite of this requirement there have been certain offenders who have not submitted their papers at the time of presentation nor subsequently for publication in the *Archives*. In some cases it has been found that papers never submitted for publication were not worth the time taken for presentation at the Congress and had never actually been carefully prepared. Other papers through neglect of one sort or another were never submitted for publication. It is the recommendation of the committee that if an essayist does not have his paper prepared at the time of its presentation and does not submit it for publication in the *Archives* that he not be allowed to present a paper at the subsequent meeting.

Respectfully submitted,
Frederic J. Kottke, *Chairman*
Louis B. Newman
Walter J. Zeiter

Public Relations

The committee has continued its efforts to promote better understanding of the work of the physicians specializing in Physical Medicine and Rehabilitation by physicians in other fields of medical practice.

Representatives of this committee joined again this year with representatives of the Section on Physical Medicine of the American Medical Association and representatives of the American Board of Physical Medicine and Rehabilitation in conferring with a similar group of orthopedic surgeons. A meeting of these two groups was held during the annual session of the American Medical Association in Chicago, June, 1956. There was complete accord between the members of the two groups and it was the feeling of all of those present that there was now a much better understanding of our mutual problems.

A similar situation, in which there is better understanding of the role of the physiatrist, exists in connection with the other medical specialties. The committee is pleased to report general improvement in our public relations program.

Respectfully submitted,
Frank H. Krusen, *Chairman*
Robert L. Bennett
Donald L. Rose

Regional Sections

This committee has considered modifications of the present geographical distribution and method of operation of the sections which might enhance their value to the membership of the Congress. Information was solicited from the chairmen of the regional sections regarding any suggestions which they might have in keeping with the sentiments of the membership in their sections. Replies were received from the chairmen of all sections. A notice was published in the *Archives of Physical Medicine and Rehabilitation* soliciting similar suggestions from the membership at large, but no response was obtained from this.

A general feeling prevails that there are too few members of the American Congress of Physical Medicine and Rehabilitation and that in many regions they are too widely scattered for any great improvement to be brought about at this time by a modification of the geographical distribution of the sections. It is generally felt that to make the sections larger in order to increase the membership of an individual section would be detrimental rather than helpful because of the travel distances involved in getting to meetings. In many areas where there are large concentrations of physiatrists at the present time, local societies of physical medicine and rehabilitation are active. Several of the chairmen suggested that activity of this type should be fostered and encouraged.

The committee makes the following recommendations:

- (1) The geographic distribution of the sections should be as follows: (a) Northwestern Section — Washington, Oregon, Montana, and Idaho — approximately ten members. (b) Western Section — California, Nevada, Utah, and Arizona — approximately 54 members. (c) Midwestern Section — Wyoming, Colo-

rado, North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa, Minnesota, Wisconsin, and Illinois—97 members. (d) Central Section—Michigan, Indiana, Ohio, Kentucky, West Virginia, and Virginia—75 members. (e) Eastern Section—Pennsylvania, Maine, New York, New Jersey, New Hampshire, Vermont, Rhode Island, Massachusetts, Connecticut, Maryland, Delaware, and the District of Columbia—279 members. (f) Southern Section—New Mexico, Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Tennessee, Alabama, Georgia, Florida, North Carolina, and South Carolina—85 members.

It will be noted that the principle changes are the transfer of Wisconsin and Illinois from the Central Section to the Midwestern Section and the amalgamation of the Southern and Southeastern Sections as a Southern Section.

(2) Advertising of the date and place, the nature of the meeting and some details of the program should be sent out at least one month in advance of the date of the meeting, both for section meetings and for local society meetings. We feel that the most effective way to stimulate interest in such a meeting is by circulation from the Chicago office of a letter giving these details. The letter should be sent to all members of the section or society concerned and also to members of the Congress in adjoining states. Notices in the *Archives of Physical Medicine and Rehabilitation* should probably be continued, but not infrequently are published too late to be of real benefit in stimulating attendance at a meeting.

(3) It is suggested that the Committee on Advances in Education establish a liaison with the American Academy of General Practice at a high level in order to find out whether section meetings or society meetings, which are going to be of one-half to one day's duration, might not be accredited for postgraduate training by the members of the American Academy of General Practice. It is felt that such accreditation by the American Academy of General Practice would be helpful in stimulating attendance at our meetings by physicians engaged in general practice.

(4) Inasmuch as there is no mention of the regional sections in the Constitution and By-laws of the American Congress of Physical Medicine and Rehabilitation, it is suggested that the Committee on Constitution and By-laws give consideration to the need, if any, for mentioning the regional sections in the Constitution and By-laws.

(5) The special Committee on Regional Sections recommends that it be dismissed at the end of the current term.

Respectfully submitted,
G. K. Stillwell, *Chairman*
Karl E. Carlson
Charles D. Shields

Rehabilitation Centers

The committee on Rehabilitation Centers has primarily concerned itself with following

the recommendations of the previous year's committee. In addition, informal contact with the committee on Advances in Education was made to encourage action by that committee in the realm of physiatrist training.

Attempts were made to obtain the results of the survey of rehabilitation facilities completed under the Medical Facilities Survey and Construction Act. However, due to an excessive workload in the office of Vocational Rehabilitation, the results were not available in a form which could be released. It was the feeling of the committee that any efforts to obtain information regarding new comprehensive Rehabilitation Centers as recommended by the previous committee would be a duplication of the work done by the office of Vocational Rehabilitation. According to Mr. Redkey's report 35 states have 40 centers to which money was allocated.

The second recommendation concerning clarification and standardization of services offered before an institution could be named a Rehabilitation Center was considered by the committee. A definition of a Rehabilitation Center was sought. There was unanimity of opinion that a Rehabilitation Center should provide medical, psychological, social and vocational services. The question of directorship of such a center and whether or not all such services should be integral parts of the center were not so easily resolved and will require further study before a complete definition is presented to the Congress for approval. All Rehabilitation Centers should have medical direction, preferably by a physiatrist when available.

The recommendation that official liaison between the Conference of Rehabilitation Centers and the Congress committee on Rehabilitation Centers be established was considered. The corporate structure of the Conference of Rehabilitation Centers is such and its by-laws are so worded that membership is by institution and not by individual. Hence the only way official liaison could be established would be through invitation by the Conference of Rehabilitation Centers to the American Congress of Physical Medicine and Rehabilitation to furnish resource personnel to help conduct the Conference workshop. The American Congress of Physical Medicine and Rehabilitation could well advise the Conference on Rehabilitation that such personnel would be available if they could be of help to the Conference. Such action is advocated by this committee.

The Committee on Rehabilitation Centers is of the opinion that a significant number of physiatrists complete their training and are certified by the American Board of Physical Medicine and Rehabilitation either with no training or too little training in comprehensive rehabilitation programs. This matter was brought to the attention of the committee on Advances in Education with the idea that eventually residents and fellows will be required to spend a minimum of time in a

comprehensive rehabilitation center and/or a department of physical medicine and rehabilitation where psychological, social and vocational programs are employed.

The committee submits the following recommendations:

1. That the results of the survey of rehabilitation facilities completed under the Medical Facilities Survey and Construction Act be obtained as soon as released and be made available to Congress members either through publication in the *Archives of Physical Medicine and Rehabilitation* or in pamphlet form.

2. That further efforts be made to define a

Rehabilitation Center to the satisfaction of the Congress members.

3. That the American Congress of Physical Medicine and Rehabilitation communicate with the Conference of Rehabilitation Centers, advising the latter organization of its willingness to cooperate by providing resource personnel at the Conference workshops.

Respectfully submitted,
Joseph N. Schaeffer, *Chairman*
Nila Kirkpatrick Covalt
Arthur A. Rodriguez
Allen S. Russek
Jerome S. Tobis
Ralph E. Worden

medical news

Members are invited to send to this office items of news of general interest, for example, those relating to society activities, new hospitals, education, etc. Programs should be received at least six weeks before the date of meeting.

Address of Welcome
by

David B. Allman, M.D.

President-Elect

American Medical Association

(Because Dr. Allman's address of welcome at the Atlantic City meeting was so favorably received, it is herewith reproduced.)

It is my pleasant task to extend the official greetings of the American Medical Association and my own personal salutations to you, the American Congress of Physical Medicine and Rehabilitation and your more than 700 members, on the occasion of this 34th annual session of the Congress.

You have come together to advance medicine. You have come to further the development of physical medicine and to promote the important movement of rehabilitation. To do all this you have come prepared to hear, to learn and to exchange scientific information, and thus be able to give even better medical care to your patients.

This Congress has contributed much vital data to medicine in the past, and I am confident that this session is going to provide more significant information to the specialists in the field of physical medicine and rehabilitation and to all physicians interested in this big segment of medicine.

As a surgeon, I am pleased to note the careful attention you are to pay to Remedial Measures for Disabilities Following Thoracic Surgery. However, I also am gratified to see many discussions listed on such medical problems as mental health, the chronically ill and aging, poliomyelitis, cerebral palsy, and vocational rehabilitation. I am happy, too, to find you are to give more reports and consideration to the subject of ultrasound, one of the most recent additions to physical medicine.

I want to take this opportunity to congratulate you and to wish you a happy birthday on this 20th anniversary of the establishment of your Registry for physical therapists. You deserve the compliments of the entire medical profession for your foresight in setting up this registry.

In 20 years, the American Registry of Physical Therapists, operated by your Congress, has grown to include more than 7,500 registrants. And during that time the Registry

has maintained "a list of physical therapists competent and qualified to administer adequately physical therapy under the prescription, direction and supervision of licensed physicians" and has promoted "a widespread utilization of such list to the end that the facilities and methods employed in physical therapy may augment effectively the services of American medicine."

I cannot think of two more important aims than these, and I want to pay tribute to the Congress for establishing so firmly, a technical ancillary personnel so essential to modern medicine and rehabilitation.

I also would like to extend to you the thanks of the American Medical Association for your valuable work in making physical medicine and rehabilitation a valuable and useful specialty. Years ago, of course, many worthwhile physical procedures unfortunately were deemed unscientific, and consequently were not put to full use. Because of your constant research and devotion to your work you have proved the effectiveness of these procedures. Today your specialty is highly developed and is highly regarded as an integral part of medicine . . . as it should be.

I sincerely hope that this Congress will continue to make every effort to see that more physicians receive training in this discipline of medicine. The demand for physicians trained in this specialty certainly is real, and I ask you to continue your valiant efforts to interest even more physicians in this important work.

The medical profession and the American Medical Association are proud of the job you are doing for physicians and patients everywhere. Like medicine in general, you are moving along at a rapid pace, and the prospects for even greater progress in the near future are extremely bright. None of us . . . in any branch of medicine . . . can relax or let down. There is too much within our reach; we just cannot afford to take it easy. The striving we do today will make medicine even better tomorrow.

Fracture Course

An intensive course on fractures and other trauma will be offered to all interested members of the medical profession by the Chicago Regional Committee on Trauma of the American College of Surgeons. The course will be

held for three and one-half days, from April 10 to 13, 1957, at the John B. Murphy Auditorium, 50 East Erie Street, Chicago.

Lectures and demonstrations will be conducted by distinguished surgeon-teachers of the Chicago area, all recognized as authorities in their fields. Clinical cases will be presented, and discussion and questions from the floor are invited.

Additional information can be obtained by writing to Leonard A. Shepanek, M.D., Chairman, Committee on Publicity, American College of Surgeons.

Subjects to be covered include bony trauma, soft tissue trauma, vascular injuries, bone grafting, traction technic, industrial casualties, farm injuries, auto crash injuries, burns, amputations, head injuries, and others.

The course is being given under the direction of Dr. Sam Banks.

Applicants for Congress Membership

Steven S. Bader, M.D., Pleasant View Sanatorium, Amherst, Ohio: Sponsored by A. B. C. Knudson, M.D., Washington, D. C.

Andre Callott, M.D., 4927 Broadview Rd., Cleveland: Sponsored by A. B. C. Knudson, M.D., Washington, D. C.

Lewis C. Fritts, M.D., 118 West End Ave., Somerville, N. J.; Sponsored by Albert A. Martucci, M.D., Abington, Pa.

Carl V. Granger, Jr., M.D., Walter Reed Army Medical Center, Washington, D. C.; Sponsored by A. F. Mastellone, M.D., Silver Spring, Md.

Charles H. Porter, M.D., 1546 Commonwealth Ave., Boston: Sponsored by Fritz Friedland, M.D., Boston.

Fellowships Available

Twenty fellowships for specialized training in working with cerebral palsied and other severely handicapped persons are available.

With a deadline of March 15, 1957, set for receipt of applications, qualified counselors and placement workers in public and private agencies interested in vocational problems of the crippled are urged to apply immediately for fellowships for the four weeks' training course. The training will be held June 17-July 12 at the Institute of Physical Medicine and Rehabilitation of the New York University—Bellevue Medical Center.

These fellowships, co-sponsored by the National Society, also known as the Easter Seal Society, and Alpha Gamma Delta, International Women's Fraternity, will amount to \$300 each covering tuition and a moderate amount of living expenses. Six points of academic credit at the graduate level will be given to those who successfully complete the course.

Selection of persons to receive these fellowships will be made on the basis of an evalua-

tion of candidates with the highest qualifications who are working for schools, agencies, business or industry who are able to make a contribution toward effective counseling and placement for the handicapped.

The course will give emphasis to the team approach in the rehabilitation of the physically handicapped and will include lectures and demonstrations by members of the staff of the Institute of Physical Medicine and Rehabilitation, New York University School of Education, and other specialists in this field.

To carry out the course, program facilities of the Institute of Physical Medicine and Rehabilitation, hospitals, rehabilitation centers, vocational and specialized training facilities, and sheltered workshops in the New York area will be utilized.

Application blanks can be obtained from the National Society for Crippled Children and Adults, 11 S. LaSalle Street, Chicago 3.

Personals

Ferdinand F. Schwartz, Birmingham, Ala., addressed the Second International Congress of Physical Medicine and Rehabilitation in Copenhagen in August of this year. His paper was titled "Physical Medicine and Rehabilitation in Arthritis." He presented a paper on "Physical Medicine and Rehabilitation in Denmark and Spain" to the Association for Mental and Physical Rehabilitation on October 26. At that meeting he was awarded a certificate of honorary membership. On November 5, Dr. Schwartz presented a paper on "Physical Medicine and Rehabilitation of the Cerebral Palsy" to the Civettes. — The VA Hospital, Houston, Texas reports that forty Chiefs and Acting Chiefs of Physical Medicine and Rehabilitation from the St. Louis Medical Area held a two-day conference there. Among those present were **Lewis A. Leavitt**, A. B. C. Knudson and **Charles Shields**. — After an extensive tour of Europe, **Grace Roth** of Rochester, Minn. has returned to Mayo Clinic. — **Otto Glasser**, Cleveland, is a contributor to the New Gould Medical Dictionary, in the special field of Medical Physics; **Robert Stecher**, Cleveland, is a contributor to the same publication in the special field of Rheumatic Diseases. — At the Southern Medical Association Golden Anniversary Meeting, held in Washington, D. C., November 12-15, **Herbert Kent** of Oklahoma City presented the paper "What Physicians Should Know About Respirators." Dr. Kent also spoke to the Indiana Planning Committee on Rehabilitation, Indianapolis, Indiana State Board of Health on November 9. His subject was "Physical Medicine and Rehabilitation in Oklahoma." — The Pennsylvania Academy of Physical Medicine and Rehabilitation at its business meeting held in November elected the following officers for the year, 1956-1957: President, **Col. Asa M. Lehman**; Vice-President, **Nicholas Mauriello**, and Secretary-

Treasurer, **J. Muri Johnston**. Dr. Mauriello was recently appointed to the Bureau of Rehabilitation as medical consultant and reviewing physician for the BOASI or Social Security Freeze.—The New Jersey Society of Physical Medicine and Rehabilitation met on January 16, Kessler Institute, West Orange, N. J., **Earl F. Hoerner**, Medical Director of the Institute, presented the topic "Electromyography and Physical Medicine."

Earl F. Hoerner, "Teamwork in the Treatment and Rehabilitation of Chronic Illness."

Robert L. Bennett, and co-author, "Application of Typing in After-Care of Poliomyelitis."

Recent Publications by Members

D. Elliott O'Reilly, "Evaluation of Cerebral Palsy Patients." *Missouri Medicine*, November, 1956.

A. T. Richardson, "Some Aspects of the Royal Free Hospital Epidemic." *Annals of Physical Medicine*, July, 1956.

Henry Milch, "Patellar Tendinosis." *Bulletin of the Hospital for Joint Diseases*, October, 1956.

Joseph G. Benton, and co-author, "Rehabilitation of the Long-Term Respirator Patient." *Journal of Chronic Diseases*, November, 1956.

Robert L. Bennett, "Evaluation of End-Results of Acute Anterior Poliomyelitis." *J.A.M.A.*, October 27, 1956.

D. A. Donio, "The Rheumatoid Patient." *Medical Times*, October, 1956.

The following articles were published in *Anales de Rehabilitacion*, July, 1956:

Clarence Dail, "La Rehabilitacion Fisica en Pacientes con Trastornos Neuromusculares."

Lewis Cohen, "La Electrovasografia en la Rehabilitacion de Pacientes con Enfermedad Arterial Periferica."

Max Newman, "Electromiografia en el Diagnostico de Condiciones Neurologicas."

The following articles were published in *The Canadian Journal of Occupational Therapy*, September, 1956:

Would You Know What To Do?

A new "common sense" kind of home nursing and first aid guide for family use, stressing prevention of accidents and illness, has been published by the Medical Department of the Equitable Life Assurance Society. The 256-page illustrated pocket-size volume, entitled "Home Health Emergencies," developed from original manuscript by **Granville W. Larimore, M.D.**, is available on individual request without charge or obligation from the Equitable's Bureau of Public Health at 393 Seventh Avenue, New York 1, N. Y.

The Medical Department has also issued a leaflet based on the book and which gives basic first aid rules in brief. The leaflet has space for notation of the phone number of the family physician, ambulance service, hospital, police station and fire department.

Purpose of "Home Health Emergencies," according to **Norvin C. Kiefer, M.D.**, Chief Medical Director of Equitable, is to help people to assume a share of responsibility for personal and family health as a step toward "assurance of a fuller life." In the foreword, Dr. Kiefer says: "Today, with new and seeming 'miracle' drugs and wondrous scientific devices, some are tempted to think of health as mostly the responsibility of physicians and nurses and technical people. But the fact is that today, even more than in days gone by, your health is your responsibility. Many of the illnesses and disabilities that beset us are preventable, if we know the facts and act on them. Many big problems start out as small ones, and about these we can do much."

book reviews

The reviews here published have been prepared by competent authorities and do not necessarily represent the opinions of the American Congress of Physical Medicine and Rehabilitation and/or the American Academy of Physical Medicine and Rehabilitation.

PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION. Patterns and Techniques. By Margaret Knott, B.S., and Dorothy E. Voss, B.Ed. Cloth. Price, \$5.50. Pp. 135, with illustrations. Paul B. Hoeber, Inc., 49 E. 33rd St., New York 16, 1956.

The reviewer finds himself somewhat in a dilemma in offering a critique of this book. For it is well-nigh impossible to define the book's exact message — and therefore to point out the areas of its greatest appeal. As a monograph on advanced kinesiology it has unusual merit, and will quickly find acceptance among graduate students of this embryonic science. But this reviewer cannot accept the forecast in the foreword to the book that its "basic principles . . . will be universally accepted as rational therapeutics." To find widespread acceptance these treatment methods would need clearer sequential description than they receive in this publication. Thus neither experimental nor clinical validation of many of the frequently repeated "axioms" of the method is mentioned in the text; the reader is not even provided with an adequate bibliography to help him with background reading. The whole manner of presentation bears closer resemblance to a manual for the converted than to a scientific appraisal and presentation of a controversial system of proprioceptive neuromuscular facilitation.

Criticism is therefore directed at the authors' unseemly haste in introducing techniques of re-education in the text without adequate discussion of the rationale behind these techniques. This failure to explain these particular treatment methods in relatively simple terms has, in this reviewer's opinion, been the major factor in preventing wider acceptance of the methods. If on the other hand, the reader is adequately informed on the earlier work of the Vallejo group, this book will fill a real need. All the techniques of facilitation are described in detail, and the authors are to be congratulated on the simplicity and clarity of their tables and diagrams. A thoroughly comprehensive chapter on their original discovery of diagonal motion patterns is the highlight of the book. Certainly this work will continue to cause much re-writing of kinesiology textbooks. The authors also place adequate emphasis on the importance of timing in the execution of the re-training techniques.

The second, and larger part of the book is devoted to illustrated descriptions of the pat-

terns of facilitation. Each of the movements is analyzed for variations in timing, the commands of the therapist; a description of the patterns used is supplemented by competently-executed black and white drawings. Since many of the technics are wholly unfamiliar to this reviewer, no attempt can be made to criticize either their clinical value or the method of their presentation. It is sufficient to point out that this textbook offers the only comprehensive description of these methods. In summary, there can be little doubt that Misses Knott and Voss have made a significant contribution to the kinesiology literature. Physicians and therapists concerned with the physical disabilities will find this textbook of inestimable value in the learning of the newer technics of facilitation. It does, however, seem a pity that the reader's understanding of rationale may not be advanced commensurately with his technical proficiency.

PRIMARY ANATOMY. By H. A. Cates, M.B., and J. V. Basmajian, M.D. Third edition. Cloth. Price, \$5.75. Pp. 339, with illustrations. The Williams and Wilkins Company, Mt. Royal and Guilford Aves, Baltimore, 1955.

The third edition of this book was rewritten by the co-author, Dr. Basmajian, as a memorial to the author and as a textbook for teaching anatomy to physical therapists, occupational therapists, physical education students and other non-medical students requiring a knowledge of human anatomy. It thus seeks to fill a need for a "universal" elementary textbook, and in so doing concerns itself with body systems considered of special importance to the student groups for which the book was written. Thus the arterial, circulatory, muscular, nervous and skeletal systems are treated in considerable detail at the expense of the other systems. The eye and ear are treated superficially as special sense organs. Brief references are made to selected clinical and diagnostic technics like electromyography in casual fashion.

The system method provides the author with a logical arrangement for the book which is divided into 13 chapters, covering the organic systems. The best chapters, are those dealing with the Muscular, Articular, and Nervous Systems. The illustrations are for the most part simple, schematic line drawings to-

gether with photographic plates illustrating surface anatomy. The text is clear, concise and well written. It should serve to stimulate the beginner in his anatomical studies and pique his curiosity to further scientific endeavors in this field.

MEDICAL EFFECTS OF THE ATOMIC BOMB IN JAPAN. Edited by *Ashley W. Oughterson, M.D., and Shields Warren, M.D.* First edition. Cloth. Price, \$8.00. Pp. 477, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36, 1956.

This book is based on the report of the Joint Commission for the Investigation of the Effects of the Atomic Bomb in Japan. The writers have presented with scientific clarity the statistical aspects of atomic and high explosive bomb warfare. The scope of destruction, number of casualties, effects of blast, heat, and radiation are documented from the several medical aspects. Case reports depict the simultaneous pathologies inflicted on the populace. There is a particularly good discussion on hematology. The photographs both black and white, as well as in color, are most striking. In particular, the bibliography is very helpful for the interested student. The destruction wrought at Hiroshima and Nagasaki is the cold light of fact. Moral judgment is not intended, but nevertheless "man's inhumanity to man" cannot be ignored.

THE CERVICAL SYNDROME. By *Ruth Jackson, M.D.* Paper. Price, \$4.75. Pp. 130, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1956.

This is a monograph from the American Lecture Series which is of value to anyone concerned with the diagnosis and treatment of neuromuscular problems involving the

neck. The author obviously has a keen interest in the symptoms and findings which occur as the result of irritation or compression of the cervical nerve roots. There is an excellent section on the anatomy of the cervical spine and the mechanism of cervical root irritation. The author presents convincing evidence to support her contention that cervical discs are extremely rare, although this would of course be disputed by most neurosurgeons.

The description of the etiology of cervical syndrome is concise and adequate. In the discussion of diagnosis considerable dispute could arise over the statement that 95 per cent of cases show one or more subluxations and that these subluxations are always of pathologic significance.

In the section on differential diagnosis, five cases are discussed to illustrate pitfalls in diagnosing cervical syndrome. According to the author, the use of a local anesthetic will always give dramatic relief in the case of cervical syndrome and thus clarify the diagnosis. The reviewer feels that this statement is also open to question.

Treatment is discussed under the headings of heat, massage, injection by local anesthetic agents, traction, correction of poor posture, immobilization, use of contour pillows, drugs, and psychotherapy. The author prefers traction in the form of the motorized intermittent traction machine. The use of collars is considered essential by her in the treatment of acute neck injuries, to be continued for three weeks or until the sprained structures are healed.

Unfortunately, in the discussion of treatment there is no clear indication of the type of patient with cervical syndrome treated, the number of treatments required, or the results of treatment. For this reason, it is impossible to judge the effectiveness of the somewhat controversial methods of treatment suggested.

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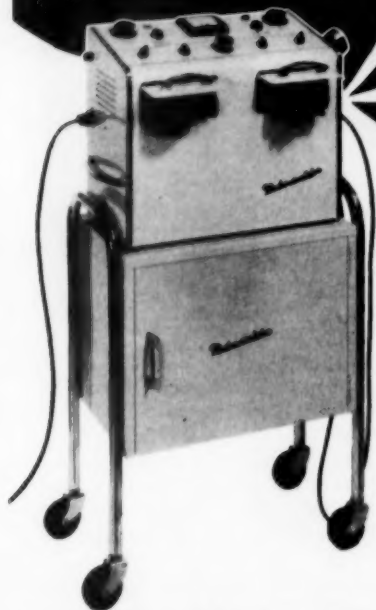
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concept in
therapy.....

...not just
ultra-sound,
not just electrical
muscle stimulation,
BUT.....

....simultaneous application
of sound and stimulation
through the sound head



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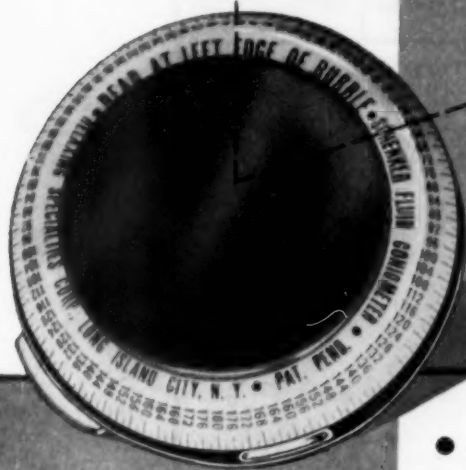
Now, his poise regained, Wise stood up to proclaim: "Thus ends the greatest balloon voyage ever made." He had come 1200 miles from St. Louis in 19 hours, setting a record unbroken for 60 years.

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*Goniometry—An improved method of joint motion Measurement—N. Y. State Journal of Medicine. Vol. 56, No. 4—Feb. 15, 1956.

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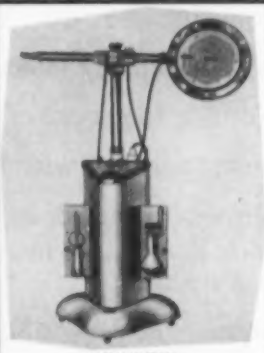
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To stimulate interest in the field of physical medicine and rehabilitation, the American Congress of Physical Medicine and Rehabilitation will award annually, a prize for an essay on any subject relating to physical medicine and rehabilitation. The contest, while open to anyone, is primarily directed to medical students, interns, residents, graduate students in the pre-clinical sciences and graduate students in physical medicine and rehabilitation. The Essay Award Committee suggests that members of the American Congress and American Academy of Physical Medicine and Rehabilitation bring this announcement to the attention of interested persons. The following rules and regulations apply to the contest:

1. Any subject of interest or pertaining to the field of physical medicine and rehabilitation may be submitted.
2. Manuscripts **must be** in the office of the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, not later than June 1, 1957.
3. Contributions will be accepted from medical students, interns, residents, graduate students in the pre-clinical sciences, and graduate students in physical medicine and rehabilitation.
4. The essay must not have been published previously.
5. The American Congress of Physical Medicine and Rehabilitation shall have the exclusive right to publish the winning essay in its official journal, the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION.
6. Manuscripts must not exceed 3000 words (exclusive of headings, references, legends for cuts, tables, etc.), and the number of words should be stated on the title page. An original and one carbon copy of the manuscript must be submitted.
7. The winner shall receive a cash award of \$200, a gold medal properly engraved, a certificate of award and an invitation to present the contribution at the 35th Annual Session of the American Congress of Physical Medicine and Rehabilitation at Hotel Statler, Los Angeles, September 8-13, 1957.
8. The winners shall be determined by the Essay Award Committee composed of four members of the American Congress of Physical Medicine and Rehabilitation.
9. All manuscripts will be returned as soon as possible after the name of the winner is announced.
10. The American Congress of Physical Medicine and Rehabilitation reserves the right to make no award if, in the judgment of the Essay Award Committee, no contribution is acceptable. The Congress may also award certificates of merit to contributors whose essays may be considered second and third best submitted. Announcement of the winner will be made at the annual meeting.

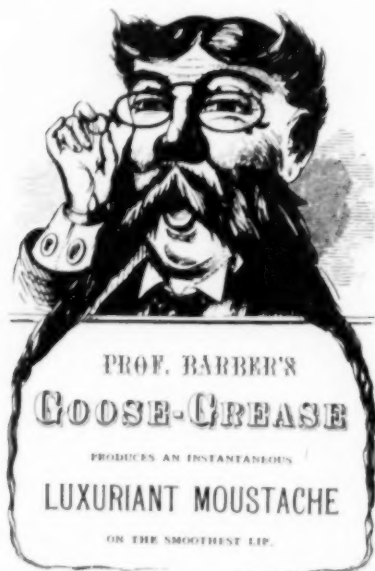


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"GOOD TECHNIC in the wrong place is bad; bad technic in the right place is bad; good technic in the right place is bad if it fails and if another form of therapy which is of greater benefit has been ignored."

"All methods of therapy which appear to be of value for a particular patient should be applied simultaneously. Often prolonged physical therapy with occasional nerve blocks and postural corrective exercises are necessary, especially in chronic pain of long duration."

This thought-provoking mouthful is from the book "Pain Syndromes" by Bernard Judovich, M.D., and William Bates, M.D., both of the University of Pennsylvania, (4th edition, published by the F. A. Davis Company, Philadelphia). I am no book critic but I should think this work should be on the "must" list of all practicing physical medicine—particularly those employing Ultrasonic energy.



Typical of the ads we will run on our new improved 1958 version of Pulvermacher's Galvanic Belt

The grandpappy of Sherlock Holmes, Hercule Poirot, and a host of their ilk, was Charles Dickens' pal in literature and lechery, one Wilkie Collins. About 1860 together with the abundant use of Laudanum, Morphia and Colchicum, Collins treated

himself with a delightful sounding gadget of physical medicine known as Pulvermacher's Galvanic Belt. Maybe there is one in a medical museum somewhere. I'll bet we could bring out a modern version and sell 'em like mad. Want to buy some stock?

Under pressure from my spouse, I started cleaning and straightening up my many book shelves the other day. Lo and behold here was a book entitled "Zone Therapy or Relieving Pain and Disease," by William H. Fitzgerald, M.D., and Edwin F. Bowers, M.D. I was a precocious youth of sixteen when I purchased this book in 1918; probably it created my first interest in physical medicine. I haven't the faintest idea who the good doctors are or were; they may be practicing still for all I know.

Most of the chapters of this book were previously published in "Everybody's Magazine," "The Strand" (England), "Every Week," "Associated Sunday Magazines," and reported enthusiastically by the eminent Bruce Barton. In support the book refers to the works of Drs. George Crile, George Starr White, Reid Kellogg, Thomas Mourninghan, Plank of Kansas City, R. T. H. Nesbitt, M. W. Maloney, William J. Hogan, Everett M. Cook, Charles H. Riggs, George O. McLean, Thomas J. Ryan, et al.

Zone therapy has to do with the immediate relief of pain in many miseries, complete analgesia even in major surgery and dental extractions, painless childbirth, cure of some disorders—all achieved by pressure for a few minutes with the fingers or special spoon-like instruments on certain motor points on the surface of the body and within the accessible orifices. (One gets rid of a headache by vigorous pressure for three minutes on the roof of the mouth with the thumb or teaspoon.) Oh yes . . . author W. H. Fitzgerald had at least one paper published in J. A. M. A., 1905. Where there is smoke, it is said, there is some fire. Now in 1957, does anyone employ the method of "Zone Therapy" as per Fitzgerald or some modification thereof? I know one eminent physiatrist who does, I think.

Cordially,

Cecil Birtcher

C. J. BIRTCHER, President
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